SIMSON0000841

NeXTWORLD

SPRING 1992

$4.95

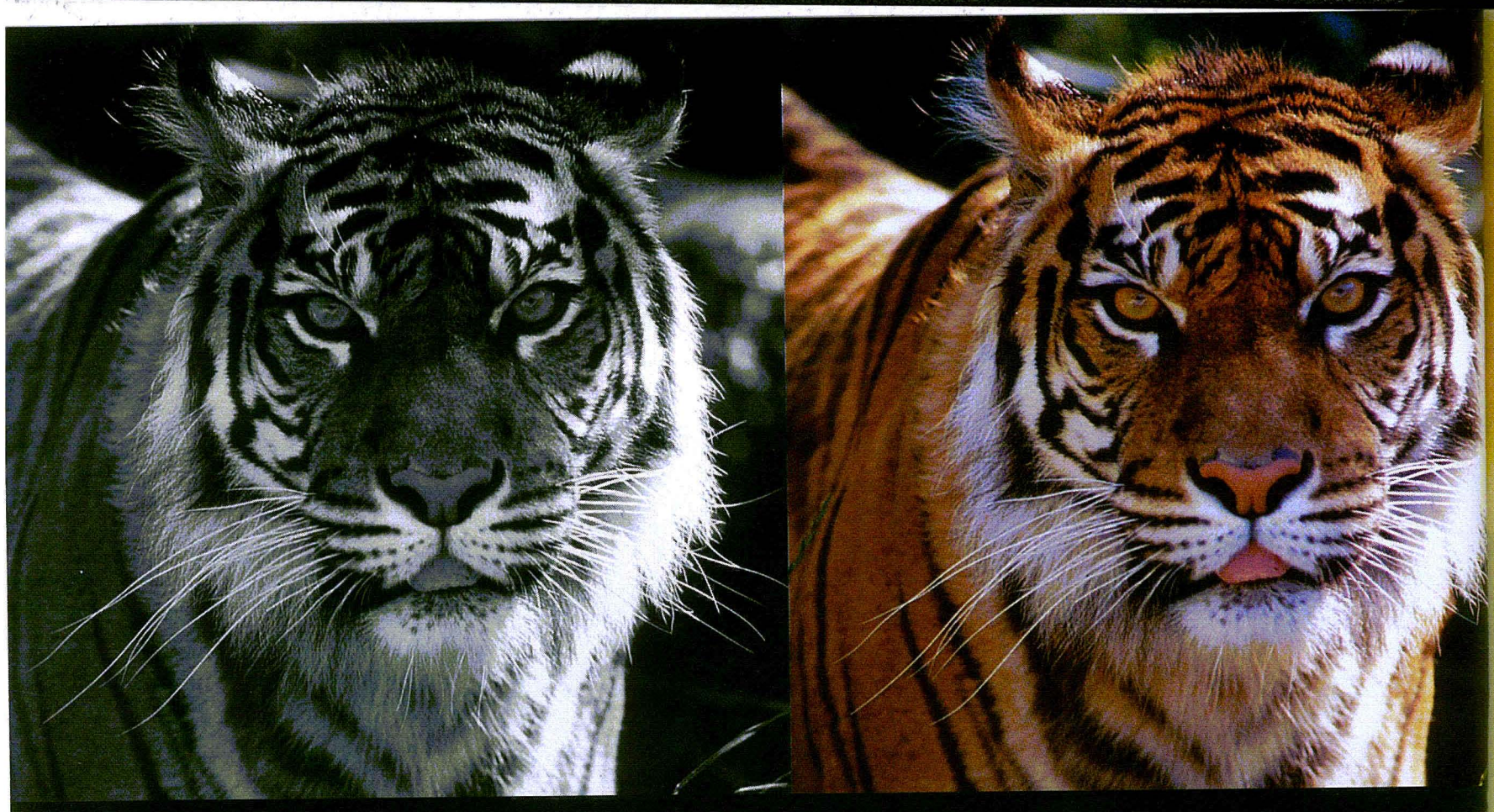
Objects of Desire
NeXT Leads the Pack in OOP

Gigabyte Appetite
A Slew of Hard Disk Options

Hello Muddah
Simson Goes to Developer Camp

He's Got Gaul
Gassée: Back To the Future





THERE'S MORE THAN ONE WAY TO SCAN A CAT.

Photos copyright ©1991 Gerry Ellis/The Wildlife Collection

Scan-X Professional™

Resolution up to 2400 dpi
256 shades of gray
Spectrum Enhancement™ technology
Comes bundled with HSD's Scan-X™ software
Optional automatic document feeder available
Available Now
Price: $2,195

Scan-X Color™

Resolution up to 2400 dpi
16.8 million colors
Spectrum Enhancement™ technology
Comes bundled with HSD's Scan-X™ software
Optional automatic document feeder available
Available Now
Price: $2,995

HSD has been developing professional imaging solutions for the NeXT™ since 1988. For more information and a FREE demo version of HSD's OCR Servant, call us at 800 828-5522. Or send a request via NeXTmail™ to info@hsd.com. Educational pricing available.

HSD™

HSD Microcomputer U.S., Inc. 1350 Pear Avenue, Suite C Mountain View, CA 94043 U.S.A. 800 828-5522 415 964-1400 (Outside U.S. & Canada) 415 964-1538 (Fax)

Circle 13 on reader service card

Ten Most Wanted

RightBrain's Gl
the U.S. Naval Rese
and The

NEX
News, an

TH
Port of call: Dan

VAN
Jean-Louis C

FL
DataPhile, Stor
fills a

MULTIN
Imagine's MediaStation a

OFFICE M
Adamation's Who's Calling

BARI
Thumbing t

ScanTastic, Dy
and

DEFAULT FO

STRATEGIES FOR
BY SETH T.

SIMSON00000842

SIMSON0000843



Photos copyright ©1991 Gerry Ellis/The Wildlife Collection

software
available

mation and a FREE
to info@hsd.com.

Canada) 415 964-1538 (Fax)

NeXTWORLD

Spring 1992, Volume 2, Issue 1

NEX - 257

Departments

OPENERS **7**
Ten Most Wanted update, best-sellers, and a NeXTcrostic

COMMUNITY **10**
RightBrain's Glenn Reid, Wolfram's Stephen Wolfram, the U.S. Naval Research Lab, NeXT globe-trotters Max Henry and Theo Wegbrans, and Field Reports

NEXTWORLD EXTRA **17**
News, analysis, and rumors of the month

Viewpoints

THE NEXT WORLD **3**
Port of call: Dan Ruby ponders NeXTstep for the 80486

LIP SERVICE **5**
Readers talk back

VANISHING POINT **100**
Jean-Louis Gassée approves of NeXT's end run

Reviews

FLAT AND SHARP **57**
DataPhile, Stone Design's flat-file database manager, fills a void with a solid first release
BY BEN CALICA

MULTIMEDIA MADE EASY **59**
Imagine's MediaStation archives multiple media in a searchable database
BY LEE SHERMAN

OFFICE MANAGER IN A BOX **62**
Adamation's Who's Calling keeps tabs on workgroup contacts and calendars
BY FRANC GARCIA

BARLOW AND LAVIN **64**
Thumbing their noses at conventional wisdom

IN BRIEF **67**
ScanTastic, Dycam camera, LockScreen, TypeView, and updates of previous reviews

How-To

DEFAULT FONTS IN WORDPERFECT **90**
BY SUSAN GRIST

STRATEGIES FOR HARD-DISK MANAGEMENT **92**
BY SETH T. ROSS AND DANIEL MILES KEHOE

Features

OBJECT LESSONS **36**
Everyone wants it, NeXT has it. So what's it mean to you?
BY CONNIE GUGLIELMO

GIGABYTE APPETITE **49**
Out of space? Extra storage options abound for NeXT users
BY DANIEL MILES KEHOE

SIMSON GOES TO CAMP **44**
Hello, Muddah. Hello, Faddah. NeXTWORLD sends an editor to Developer Camp
BY SIMSON L. GARFINKEL

DIGITAL DEPUTY **53**
NeXT wins the shootout to provide an executive support system for the Los Angeles County Sheriff's Department
BY PAUL KARON

Special Report: New for '92

JOY RIDE **22**
The new NeXTstation Turbo machines break the speed barrier with a 33MHz chip and interleaved memory
BY SIMSON L. GARFINKEL

COLOR FOR EVERYONE **27**
The NeXT Color Printer redefines the entry level for desktop color printing
BY DARCY DINUCCI AND DAN LAVIN

GOODYBYE OPTICAL, HELLO CD-ROM **29**
NeXT's new CD-ROM drive adds another chapter to NeXT's storage story – and its software distribution strategy
BY SIMSON L. GARFINKEL AND DAN LAVIN

ANOTHER STEP FORWARD **31**
3-D graphics and enhanced communications headline the upcoming release of NeXTstep 3.0
BY CHARLES L. PERKINS

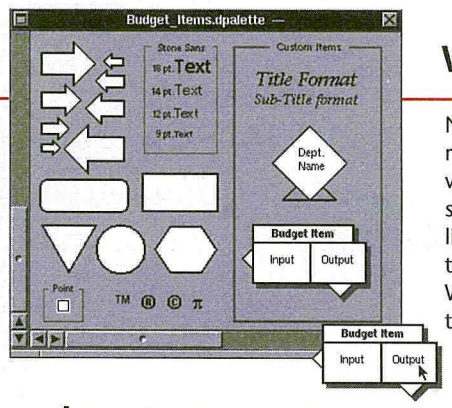
♣

Cover Photography by Henrik Kam

Work smart. Not hard.

DIAGRAM!™

A graphics tool for people who think and draw at the same time.

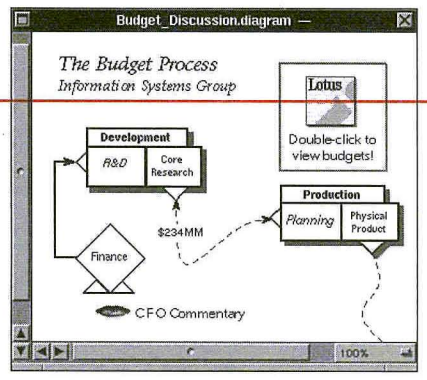


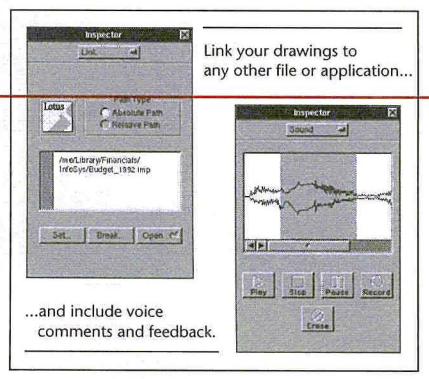
We're as fast as you are...

Not long ago, we at Lighthouse Design™ had a radical idea: let's make a graphics tool for those who think and draw at the same time. Pretty soon after, we figured out that everyone draws a little differently. So we built a tool that lets you teach it your style with a simple mouse click. Which frees you up to spend more of your time thinking and less of it drawing.

...almost as smart...

It's a sad fact, but most drawing tools are built for freehand illustrators. Which is fine if you spend your days drawing penguins and pears, but not so fine if you don't. If you're like us, you spend your days doing battle with business or admin graphics and technical documentation. So it's nice to know that Diagram!™ was built for those tasks. And not for drawing fruit.





...and just as well-rounded.

We all use pictures to simplify complex ideas and data. To tell the whole story, though, it's nice to have background information right at your fingertips—even if it's from a different application, like a spreadsheet or a word processor. How do you integrate all those files? With Diagram! of course. Just drop them into drawing objects and they're a mouse-click away.

Just think about that.

© 1992 Lighthouse Design, Ltd. All rights reserved. Diagram!, the Diagram! logo, Lighthouse Design, and the Lighthouse Design logo are trademarks of Lighthouse Design, Ltd. All other trademarks are the property of their respective owners.

LIGHT HOUSE DESIGN

Considerable Academic Discounts available. To order, please contact your local authorized NeXT reseller or NeXTConnection at 800-800-NeXT or 603-446-3383

Circle 29 on reader service card

NeXTWORLD

Vol. 2, No. 1 *SPRING 1992*

President and Publisher **Gordon Haight**
Associate Publisher **Jeannine Barnard**
Editor in Chief **Daniel Ruby**

EDITORIAL
Executive Editor **Laurie Flynn**
Managing Editor **Darcy DiNucci**
Senior Editor **Dan Lavin**
Senior Editor **Simson Garfinkel**
Copy Editors **Eliot Bergson, Sue Troy**
Contributing Editors **Joe Barello, John Perry Barlow, Tony Bove and Cheryl Rhodes, Don Crabb, Joe Hutsko, Daniel Miles Kehoe, Robert Lauriston, Charles L. Perkins, Richard M. Reynolds, Seth Ross, Bruce Webster**

ART AND DESIGN
CKS Partners San Francisco, California

PRODUCTION
Director of Manufacturing **Jayne Boyer**
Manufacturing Manager **Hilal Sala**

ADVERTISING SALES
Account Representative **Jacqueline Caldwell**
415/978-3188

ADMINISTRATION
Operations Manager **Graciela Eulate**
Director of Information Services **Kevin Greene**
Corporate Services Manager **Cynthia J. Meade**

CIRCULATION
Circulation Director **Ed Chittenden**
Circulation Manager **Jaana Nieuwboer**
Single-Copy Sales Director **George Clark**
Single-Copy Sales Representative **Marty Garcher**
Fulfillment Coordinator **Michael Goldstein**
Circulation Assistant **Peter Guastella**

IDG CORPORATE ADMINISTRATION
Director of Finance **Vicki Peilen**
Financial Analyst **Madeleine Buckingham**
Accounting Manager **Pat Murphy**

To reach *NeXTWORLD* by mail or courier, use this address: *NeXTWORLD*, 501 Second Street, San Francisco, CA 94107. You can also contact *NeXTWORLD* via the Internet at nextworld@nextworld.com, via MCI mail at NEXTWORLD, or via fax at 415/978-3196.

NeXTWORLD is published quarterly by Integrated Media, 501 Second Street, San Francisco, CA 94107, a subsidiary of IDG Communications, the world leader in information services on information technology. Basic subscription rate is $39.90 for four quarterly issues and eight monthly newsletters. California residents add 7.25 percent sales tax. Foreign orders must be prepaid in U.S. funds with additional postage. For Canada, add $15. All other foreign orders add $40 for airmail and $15 for surface mail delivery. FAX 415/442-1891 to charge VISA/MC. For new subscriptions call toll-free 800/745-7002; for subscriber service questions call 800/755-6398; write Subscriber Services, P.O. Box 56429, Boulder, CO 80322-6429; or e-mail subscrip@nextworld.com. Application to mail at second-class postage rates pending at San Francisco and additional mailing offices. For permission to quote or reproduce editorial material from *NeXTWORLD*, send a written request stating the issue date, article, page numbers, and exact text of the material to: Reprints and Permissions, *NeXTWORLD* Production, 501 Second Street, San Francisco, CA 94107. For back issues of *NeXTWORLD*, write to: Back Issues, *NeXTWORLD*; $8 per issue; $18 per issue outside U.S. prepaid.

POSTMASTER: Send address changes to *NeXTWORLD*, P.O. Box 56429, Boulder, CO 80322-6429.
Editorial and business offices: 501 Second Street, San Francisco, CA 94107, 415/243-0600.
NeXTWORLD is a publication of Integrated Media.
Printed in the United States of America. *NeXTWORLD* is a trademark of NeXT Computer and is used under license. This publication is not affiliated with NeXT Computer.

Copyright © 1992 Integrated Media.
All rights reserved. Canadian GST #124669433.

The NeXT con
gathered in San
Expo. NeXT
shipped its sec
ware. After a
strategy, NeX
in place, which showed up
roughly $150 million for th

But if 1991 was the ye
ship and sales credibility, 19
establish critical mass. For
strategies are fully in synch
oriented operating system fo
The Expo was to serve as a
breakthrough year.

To kick off the year, Ne
bagful of new product annc
ing NeXTstation Turbos, a n
NeXTstep, and a hot new
product is a solid advance in
but each was perhaps also
ing existing partners and exte
nology. "New for '92," the Sp
issue, looks in depth at NeX

★ ★

The surprise announcement
prise enough that we didn't g
it into our issue – is NeXT's
NeXTstep to the Intel 80
At this writing, it was unkn
NeXT would announce abo
It will likely commit to a deliv
mid- to late-1992), announc
announce a roster of hardwa

The upside from this mo
is tremendous: A NeXTstep
Between new systems and '4
would get a rapid boost, lead
revitalized distribution chan

There is also a downside
hardware sales. The port is la
ket yawns. At this point ther

1. *What machines will it*
is about 3 million, and the ch
current business. Yet many ir
sufficient graphics performan
recognized names are expecte
and sold with NeXTstep.

2. *How will NeXT sell it*
product to system manufactu
CD-ROM product sold throu
force. NeXT will stress the co
in comparing its price to com

SIMSON00000844

SIMSON00000845

WORLD

1 SPRING 1992

iblisher Gordon Haight
sher Jeannine Barnard
Chief Daniel Ruby

ITORIAL
Editor Laurie Flynn
ditor Darcy DiNucci
ditor Dan Lavin
or Simson Garfinkel
Eliot Bergson, Sue Troy
llo, John Perry Barlow, Tony Bove and
, Joe Hutsko, Daniel Miles Kehoe,
L. Perkins, Richard M. Reynolds,
s, Bruce Webster

AND DESIGN
an Francisco, California

ODUCTION
nufacturing Jayne Boyer
ng Manager Hilal Sala

TISING SALES
ntative Jacqueline Caldwell
5/978-3188

NISTRATION
Manager Graciela Eulate
ation Services Kevin Greene
Manager Cynthia J. Meade

CULATION
Director Ed Chittenden
anager Jaana Nieuwboer
les Director George Clark
Representative Marty Garcher
dinator Michael Goldstein
ssistant Peter Guastella

TE ADMINISTRATION
f Finance Vicki Peilen
st Madeleine Buckingham
Manager Pat Murphy

by mail or courier, use this address:
nd Street, San Francisco, CA 94107.
NeXTWORLD via the Internet at
m, via MCI mail at NEXTWORLD,
x at 415/978-3196.

shed quarterly by Integrated Media,
ncisco, CA 94107, a subsidiary of IDG
rld leader in information services on
sic subscription rate is $39.90 for four
nonthly newsletters. California residents
x. Foreign orders must be prepaid in
postage. For Canada, add $15. All other
irmail and $15 for surface mail delivery.
arge VISA/MC. For new subscriptions
2; for subscriber service questions call
riber Services, P.O. Box 56429, Boulder,
l subscrip@nextworld.com. Application
tage rates pending at San Francisco and
. For permission to quote or reproduce
TWORLD, send a written request stating
page numbers, and exact text of the
ermissions, *NeXTWORLD* Production,
ancisco, CA 94107. For back issues of
e to: Back Issues, *NeXTWORLD*;
per issue outside U.S. prepaid.

address changes to *NeXTWORLD*,
9, Boulder, CO 80322-6429.
iness offices: 501 Second Street,
, CA 94107, 415/243-0600.
publication of Integrated Media.
States of America. *NeXTWORLD*
Computer and is used under license.
ot affiliated with NeXT Computer.
© 1992 Integrated Media.
d. Canadian GST #124669433.

The NeXT community had ample reason to celebrate as it gathered in San Francisco in January for the first *NeXTWORLD* Expo. NeXT was coming off a solid 1991, during which it shipped its second-generation computers and system software. After a midsummer reversal in its sales and marketing strategy, NeXT closed the year with a coherent plan finally in place, which showed up in NeXT's first year of respectable sales, roughly $150 million for the calendar year.

But if 1991 was the year that NeXT established its technical leadership and sales credibility, 1992 is the year in which the company needs to establish critical mass. For the first time, NeXT's product and marketing strategies are fully in synch, built around the advantages of its object-oriented operating system for custom development of strategic applications. The Expo was to serve as a milestone, marking the beginning of NeXT's breakthrough year.

To kick off the year, NeXT came to *NeXTWORLD* Expo with a bagful of new product announcements, including NeXTstation Turbos, a major new release of NeXTstep, and a hot new color printer. Each product is a solid advance in NeXT technology, but each was perhaps also predictable, involving existing partners and extending existing technology. "New for '92," the Special Report in this issue, looks in depth at NeXT's January lineup.

★ ★ ★

The surprise announcement at the Expo – surprise enough that we didn't get a full story about it into our issue – is NeXT's intention to port NeXTstep to the Intel 80486 architecture. At this writing, it was unknown exactly what NeXT would announce about NeXTstep '486. It will likely commit to a delivery date (probably mid- to late-1992), announce a price range (about $1000 list), and announce a roster of hardware and software partners.

The upside from this move into the portable operating systems market is tremendous: A NeXTstep PC costing about $3000 would be a hot box. Between new systems and '486 upgrades, the installed NeXTstep base would get a rapid boost, leading to renewed application development and revitalized distribution channels.

There is also a downside: NeXTstep '486 sales cannibalize NeXT hardware sales. The port is late or incomplete or slow or buggy. The market yawns. At this point there are more questions than answers.

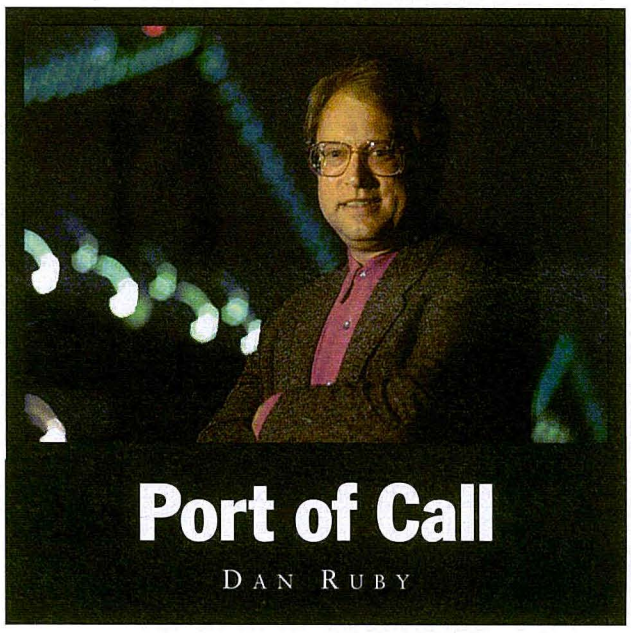
1. *What machines will it run on?* The installed base of '486 machines is about 3 million, and the chip represents about 20 percent of Intel's current business. Yet many installed '486 PCs will not be equipped with sufficient graphics performance to run NeXTstep. Several OEMs with recognized names are expected to announce PC systems configured for and sold with NeXTstep.

2. *How will NeXT sell it?* NeXTstep '486 will be sold as an OEM product to system manufacturers and VARs and as a stand-alone CD-ROM product sold through distribution and by NeXT's direct sales force. NeXT will stress the combination of tools included in NeXTstep in comparing its price to competitive operating systems. For example, a comparable Windows system would cost $2500.

3. *Who is the customer?* The UNIX market for Intel systems is already sizable. Santa Cruz Operation had sales of more than $100 million last year in the '486 market. Sun has targeted Intel PCs with its Solaris 2.0, due in the summer. Windows NT and Taligent wait in the wings. If NeXT can strike quickly enough, NeXTstep '486 will be very attractive, for the same reasons that NeXTstep 3.0 is attractive: object orientation, Display PostScript, and development tools.

4. *Is it deliverable?* Porting to the Intel architecture is not a trivial matter. How well will the Intel instruction set run Display PostScript? How will it compare in performance to Motorola-based NeXT hardware? How will it look on the lower-resolution displays? To succeed, NeXTstep '486 has to be a solid product technically.

5. *Which third parties will endorse it?* Expect to hear blessings from Intel, Adobe, Novell, Lotus, and WordPerfect. More important will be the cast of PC makers who announce system bundles.



Port of Call

DAN RUBY

6. *Will it accelerate NeXTstep software development?* It depends entirely on sales. If the release leads to a doubling or more of the NeXTstep installed base, more developers will be attracted to the platform.

7. *How will third-party developers support dual instruction sets?* A technique called "fat binaries" will enable commercial and in-house developers to include both executables in the same application wrapper. That means that developers won't need to ship two different versions of their products.

8. *Will it cannibalize hardware sales?* Yes, some potential hardware customers will opt for the less-expensive route. But if the strategy works, then the rising tide should also benefit NeXT hardware. The challenge for NeXT's hardware team will be to enhance and differentiate NeXT's systems, assuring that NeXTstep always runs best on NeXT computers. NeXT's own future chip architecture is still up in the air (see The NeXT World, Winter 1991), but the '486 port would be a head start if NeXT planned future systems around the Intel '586, for example.

9. *How will NeXT support it?* This one is not simple. Even with OEMs, VARs, and dealers taking over some of the load, NeXT will have to expand its support operation. Many of the services can be for a fee, but NeXT must be prepared for increased support demands.

10. *Will NeXT port to other platforms?* For now, Intel is it. SPARC makes a lot of sense, too, with its sizable installed base. But committing to a port involves a serious investment of resources. For now, the big potential win is on '486 machines.

NeXT has never been known for playing it safe. Even though it is a dramatic departure in strategy, NeXTstep '486 fits the company's pattern of taking huge gambles on its great technology. Building on the successes of 1991, and combined with the other new products announced this month, NeXTstep '486 could be the spark that makes 1992 the year that NeXT breaks through into the computer mainstream.

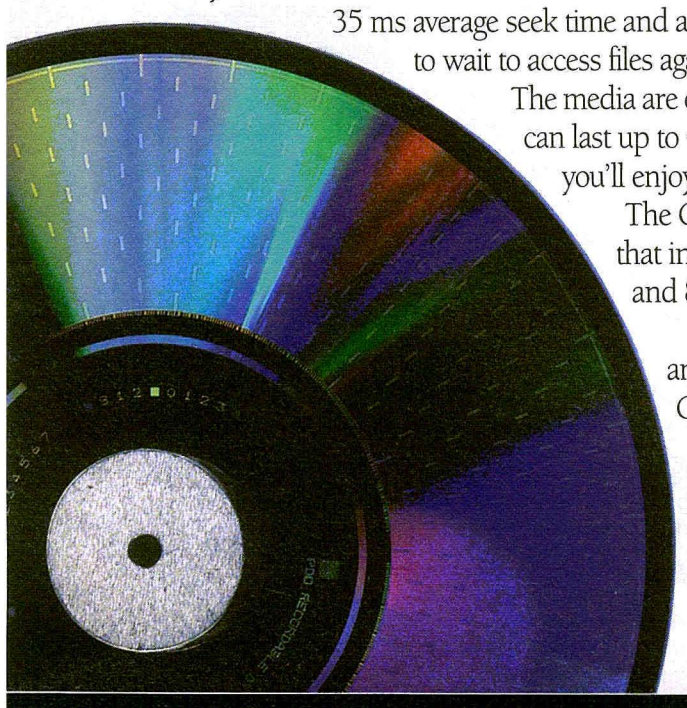
DAN RUBY *is editor in chief of* NeXTWORLD.

THE NeXT BEST THING TO ON-LINE STORAGE: OUR 1GB OPTICAL DISK DRIVE.



When you need information at your fingertips fast, you need the CY-2000 magneto-optical disk drive from Contemporary Cybernetics Group. It's like having unlimited storage space. With the ability to access files in seconds. We call it "near-line" storage, and it's fully plug and play compatible with your NeXT computer system.

Each erasable-rewritable optical platter stores one full gigabyte – perfect for data intensive applications like multi-media, desktop publishing and digital video. Plus, it's ideal for private databases and security-sensitive files because the disks can be removed to prevent unauthorized access. With a 35 ms average seek time and a 10 Mbits per second transfer rate, you'll never have to wait to access files again.



The media are erasable, rewritable and extremely durable. One platter can last up to 40 years. And because they're small and lightweight, you'll enjoy reduced storage and shipping costs.

The CY-2000 is part of our family of data storage products that includes QIC streamers, magneto-optical disk drives, and 8mm helical scan tape subsystems and libraries.

If file access is trying your patience, don't wait another minute. For complete information on the CY-2000, call today at (804) 873-9000.

TRUE "PLUG-AND-PLAY" COMPATIBILITY WITH:

Alliant	Gould	PC 386/ix
Alpha Micro	HP	PC MS-DOS
Altos	IBM AS/400	PC Xenix/ Unix
Apollo	IBM Mainframe	Pertec
Arix	IBM RISC/6000	Plexus
AT&T	IBM RT	Prime
Basic-4	IBM S/38	Pyramid
Concurrent	ICL	Sequent
Convergent	Macintosh	Silicon Graphics
DataGeneral	McDonnell Douglas	Stratus
DEC 3100	NCR	Sun
DEC BI-Bus	Novell	Unisys
DEC HSC	OS/2	Wang
DEC Q-Bus	PS/2	*and more*
DEC TU/TA81		
DEC Unibus		

CONTEMPORARY CYBERNETICS Group

Rock Landing Corporate Center • 11846 Rock Landing, Newport News, VA 23606
804/873-9000 • FAX 804/873-8836

Europe Tel: +31 8385 51708 FAX: +31 8385 50596 **Scandinavia** Tel: +47 2 79 58 80 FAX: +47 2 78 36 01 **France** Tel: +33 88 67 12 45 FAX +33 88 66 79 19 **Japan** Tel: +81 3 3639 5841 FAX: +91 3 3639 5865 **U.K.** Tel: +44 7373 73544 FAX: +44 7373 62813 **New Zealand** Tel: +64 9 479 1100 FAX: +64 9 479 8009 **R.O.C.** Tel: +886 2 5068702 FAX: +886 2 5014198

Circle 25 on reader service card

The limits of zeal

Regardless of what Guy Ka
says (Vanishing Point, Fall
evangelism for the NeXT is
starter. Personal computers
widely accepted productivit
There is no longer any neec
"converts." NeXT must av
evangelical-zealot attitude b
clouds sound business judg
with a veil of utopian naive
chauvinistic elitism.

GERARDO ARNOLDO TARA
Paris, France

Two birds

NeXT could solve several p
at once by encouraging the
used NeXT computers. Ne
retailers could upgrade NeX
by taking trade-ins of old e
ment on the sale of new sys
The result would be a need
upgrade path from the bott
the NeXT line to the top, a
availability of an ultra-chea
level NeXT machine.

MICHAEL A. DUKE
Logan, Utah

The man and the ma

I have received a few issues
NeXTWORLD and am ve
pleased with the helpful tec
information inside. Howev
like many NeXT users, I nc
believe in the machine, I al
believe in the vision of the
the company that created
machine. In future issues I
would be appreciated if the
more information on event
cerning Steve Jobs and NeX
Computer, as well as more
wonderful technical inform

PETER J. RUCKI
Pittsburgh, Pennsylvania

When are you going to hav
guts to face the biggest que
about the NeXT: Will it su

SIMSON00000846

SIMSON00000847

ORAGE:

PLUG-AND-PLAY"
ATIBILITY WITH:

Gould	PC 386/ix
HP	PC MS-DOS
IBM AS/400	PC Xenix/
IBM Mainframe	Unix
IBM RISC/6000	Pertec
IBM RT	Plexus
IBM S/38	Prime
ICL	Pyramid
Macintosh	Sequent
McDonnell Douglas	Silicon Graphics
NCR	Stratus
Novell	Sun
OS/2	Unisys
PS/2	Wang
	and more

MPORARY
RNETICS
Group
ews, VA 23606
ance Tel: +33 88 67 12 45
4 7373 62813

The limits of zeal

Regardless of what Guy Kawasaki says (Vanishing Point, Fall 1991), evangelism for the NeXT is a non-starter. Personal computers are a widely accepted productivity tool. There is no longer any need for "converts." NeXT must avoid the evangelical-zealot attitude because it clouds sound business judgment with a veil of utopian naiveté and chauvinistic elitism.

GERARDO ARNOLDO TARANGO
Paris, France

Two birds

NeXT could solve several problems at once by encouraging the resale of used NeXT computers. NeXT retailers could upgrade NeXT users by taking trade-ins of old equipment on the sale of new systems. The result would be a needed upgrade path from the bottom of the NeXT line to the top, and the availability of an ultra-cheap, entry-level NeXT machine.

MICHAEL A. DUKE
Logan, Utah

The man and the market

I have received a few issues of *NeXTWORLD* and am very pleased with the helpful technical information inside. However, like many NeXT users, I not only believe in the machine, I also believe in the vision of the man and the company that created the machine. In future issues I think it would be appreciated if there were more information on events concerning Steve Jobs and NeXT Computer, as well as more of the wonderful technical information.

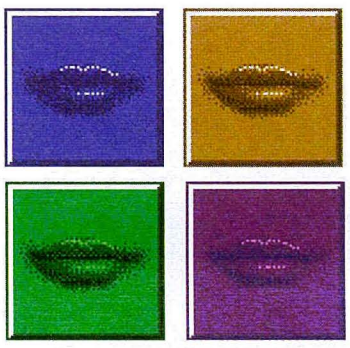
PETER J. RUCKI
Pittsburgh, Pennsylvania

When are you going to have the guts to face the biggest question about the NeXT: Will it survive? *NeXTWORLD* has the resources to give a comprehensive answer to the question. The relevant information is capitalization, employee size, sales figures, materials costs, and overhead.

Once you do that, it would be useful to tackle some of the other common rumors: How much did NeXT pay Lotus to develop/bundle Improv? Why did the IBM/NeXT deal fall apart? Who else is looking into NeXTstep? Why do/do not companies (like Quark) develop for the NeXT?

ERNEST N. PRABHAKAR
Pasadena, California

We're as fascinated by Steve Jobs as is Mr. Rucki, but the NeXT community is more than a cult of personality. As for our guts, we will continue to report on NeXT financials and business relationships in NeXTWORLD Extra. *– NW*



Horse races

While I appreciate the increased product reviews and how-to information in the new *NeXTWORLD*, I don't think that the avant-garde/futuristic articles should have been eliminated. After all, it is these articles that inspire dreaming and the creation of wonderful things. A small column will more than suffice. Most computer professionals could use a bit of dreaming in their periodicals. Rather than a static force committed to repeating tips and reviews, your magazine would then be an active participant in the world of ideas.

ALBERTO RICART
Milwaukee, Wisconsin

Congratulations on your new "look and feel." The old format was great for teaching a philosophy class but the new format is more informative and substantive.

BRUCE YARBRO

Internet as Life

One thing I like about *NeXTWORLD* is the treatment of the Internet (with or without big-I). As you know, few popular computer magazines even notice that it exists, while you, quite correctly, treat it as a normal everyday fact of life. I hope you continue that theme, and help the NeXT community get hooked up together.

LEE SAILER
North East, Pennsylvania

Check the fax

Some glaring errors were made in the review of the Neuron FAX96+ ("A Class by Itself," *NeXTWORLD* Winter 1991). Error Number One: You list the modem as being V2.2, V3.2, V4.2bis. ALL wrong! It's V.22, V.32, and V.42bis. And even that's wrong. The modem is actually a V.32bis and V.42bis modem, with V.22 and anything else as compatible with older stuff.

Error Number Two: You don't even mention what those standards are for. The new V.32bis/V.42bis standards are quickly establishing dominance; various manufacturers are coming out with versions of these for less than $300. And a lot of these "standard" version V.32bis/V.42bis implementations won't work well with other manufacturers' modems. So a very big thing right now is talking about how well these various V.32's work together.

DOUG MCCLURE
West Lafayette, Indiana

We regret the error in the modem descriptions. Because of space limitations, we were unable to provide an analysis of modem standards. Such information is easily found in a large number of communications periodicals. – NW

"I didn't write that!"

I wrote a Mathematica review for the Winter 1991 issue of *NeXTWORLD* ("Math for the Masses"). What was published was very different from what I wrote and I'd like to make some clarifying comments.

I never said that documentation wasn't available, and I realize the kernal is identical on different machines and that Wolfram's great book for the kernal instructions is bundled free with the software. The earlier version did not have a compiler, that was the problem.

The many beautiful color graphs I was asked to produce were largely thrown away, and the paltry few that were left were shrunk over 90 percent, put into black and white, and placed on an illegible brown background. Mathematica is not a utility that can be fairly treated in one page, nor should it be. Many *NeXTWORLD* readers got their Cube just to run this program!

BRUCE BERKOFF
Berkeley, California

***NeXTWORLD* welcomes your comments. Please send them to *Letters at NeXTWORLD*, 501 Second St., San Francisco, CA 94107, or e-mail letters@nextworld.com.**

Adobe Presents
The Two Most Precise Design Tools Ever Invented

{ with the possible exception of your own two hands }.

1. ADOBE ILLUSTRATOR
software offers complete control of even the most elaborate artwork.



2. ADOBE TOUCHTYPE
software lets you manipulate type visually, without using dialog boxes.

Adobe presents a graphic design combination for NeXT™ that gives you the precision and "hands-on" control you once enjoyed only at the drawing board.

Adobe Illustrator® 3.0 software uses the power of NeXT to let you create artwork from concept to final color separation. It allows you to zoom in and out of images, and offers such options as editing in preview mode and autotracing by color.

Adobe TouchType™ software is an innovative new typographic program designed to create and edit headline type. It gives you precise control of kerning, leading and tracking—simply by moving the cursor.

As an added bonus, we're offering, free, over 20 typefaces with the purchase of Adobe Illustrator (worth over $900) and 12 typefaces with Adobe TouchType (worth over $500).



For more information, visit the Adobe or NeXT Authorized Dealer nearest you. Or call Adobe at 1-800-833-6687, and ask for Dept. A, ext. 4845.

ADOBE®
Adobe Systems Incorporated

Adobe, Adobe Illustrator, the Adobe logo are registered trademarks registered in the USA and other countries, and Touchtype is a trademark of Adobe Systems Incorporated. NeXT and the NeXT logo are trademarks of NeXT Computer, Inc.
Copyright © 1991 Adobe Systems Incorporated. All rights reserved.

Circle 12 on reader service card

TE

HERE'S *NEXTWORLD'S* LIS

RANK	QTRS ON LIST	ITEM
1	3	PAGE-LAYO
2	3	CAD SOFT
3	3	16-BIT-COL
4	3	WORLD-CL
5	1	JPEG COM
6	2	REASONABL
7	1	NEXT POR
8	1	SLAB WITH
9	3	RELATIONA FRONT END
10	3	ON-LINE N

ITEM
3-D GRAPHICS/ANIMATION*
INEXPENSIVE COLOR PRINTER
NEXT MARKETING MESSAGE
NEXTWORLD EXPO
OS DISTRIBUTION VIA CD-RO
NEXTSTEP PORT TO INTEL PC
NEXT SUPPORT FOR MAC FLO

*Announced but shipping

ITEM
LOW-COST, ENTRY-LEVEL SYST
SCSI OD
FILE-SYSTEM ALIASES
MULTIUSER PROJECT-MANAGE
CHOICE OF KEYBOARDS
RISC WORKSTATION
BUILT-IN MIDI PORTS OR CAR
EXTENDED TEXT OBJECT
SERVICES FOR LINKING APPLIC
NEXTSTEP PORT TO SPARCS
HYPERTEXT AUTHORING SYST

SIMSON00000848

SIMSON00000849

E TOUCHTYPE
ou manipulate type
out using dialog boxes.

It gives you
cking—simply

20 typefaces with
over $900) and
1 over $500).
visit the Adobe
er nearest you.
5-6687, and ask

ADOBE®
Adobe Systems Incorporated

uter, Inc.

TEN MOST WANTED

HERE'S *NEXTWORLD'S* LIST OF NEEDED PRODUCTS, TECHNOLOGIES, AND SERVICES.

RANK	QTRS ON LIST	ITEM	COMMENT
1	3	PAGE-LAYOUT PROGRAM	PasteUp and Pages on the horizon
2	3	CAD SOFTWARE	Nowhere in sight
3	3	16-BIT-COLOR UPGRADE PATH	Original Cube owners still locked out
4	3	WORLD-CLASS SERVICE/SUPPORT	Even with NeXTedge, too many users still out in the cold. Add a 900 number?
5	1	JPEG COMPRESSION	Essential for multimedia
6	2	REASONABLY PRICED RAM	NeXT's price-gouging hurts the company
7	1	NEXT PORTABLE/NOTEBOOK	If Apple can do it . . .
8	1	SLAB WITH SLOTS	Encourage third-party add-ons
9	3	RELATIONAL DATABASE FRONT END	3.0's DBKit is part of solution, but third-party software still needed
10	3	ON-LINE NEXT INFO SYSTEM	With 3.0's ISDN, is it on the way?

IN THE BAG

ITEM	DATE REMOVED	COMMENT
3-D GRAPHICS/ANIMATION*	Jan. 1992	3-D Kit in NeXTstep 3.0
INEXPENSIVE COLOR PRINTER*	Jan. 1992	NeXT Color Printer shipping in spring
NEXT MARKETING MESSAGE	Nov. 1991	Custom app strategy makes sense
NEXTWORLD EXPO	Jan. 1992	First of many
OS DISTRIBUTION VIA CD-ROM*	Jan. 1992	NeXTstep 3.0 due in spring
NEXTSTEP PORT TO INTEL PCS*	Jan. 1992	Due in summer
NEXT SUPPORT FOR MAC FLOPPIES*	Jan. 1992	In NeXTstep 3.0

*Announced but shipping

UP-AND-COMERS

ITEM	COMMENT
LOW-COST, ENTRY-LEVEL SYSTEM	NeXTclassic?
SCSI OD	Long live the optical drive
FILE-SYSTEM ALIASES	Organize files by project
MULTIUSER PROJECT-MANAGEMENT SOFTWARE	Standard IPC application
CHOICE OF KEYBOARDS	UNIX users prefer the old one
RISC WORKSTATION	More MIPS for the money
BUILT-IN MIDI PORTS OR CARD	Could be a great music box
EXTENDED TEXT OBJECT	Custom apps need advanced features
SERVICES FOR LINKING APPLICATIONS	Custom environments from stand-alone apps
NEXTSTEP PORT TO SPARCSTATIONS	Great hardware needs great software
HYPERTEXT AUTHORING SYSTEM	Essential for multimedia

STREET PRICES

These are the best prices we could find, as of press time, on in-demand NeXT products. You should be able to match the price with a little shopping.

HARDWARE

PRODUCT	BEST PRICE	WHERE
NEXTSTATION COLOR (105MB hard drive, 12MB RAM)	$7995	NeXT or any dealer
NEXTDIMENSION BOARD (8MB RAM)	$3995	NeXT or any dealer
1MB SIMMS	$34	Chip Merchant, 800/426-6375
4MB SIMMS	$125	Chip Merchant, 800/426-6375
1.4MB FLOPPIES	$12.95/10	Fry's Electronics, 408/733-1770
2.88MB FLOPPIES	$79.00/10	NeXTConnection, 408/733-1770
660MB HARD DISK	$1205	Tecor, 408/458-3197
1.2GB HARD DISK	$1815	Tecor, 408/458-3197

SOFTWARE

PRODUCT	LIST	STREET
WRITENOW 2.0 (Appsoft)	$199	$159
IMPROV 1.0 (Lotus Development)	$695	$549
ILLUSTRATOR 3.0 (Adobe Systems)	$699	$459
SOFTPC 2.0 (Insignia Solutions)	$499	$329
MATHEMATICA 2.0 (Wolfram Research)	$1495	$1295
FLOPPYWORKS 2.2 (Digital Instrumentation Technology)	$99	$69

BEST-SELLERS

These are the hottest-selling NeXT products as of press time, according to NeXTConnection, a mail-order distribution source for NeXT products. Note that NeXTConnection handles most, but not all, NeXT products.

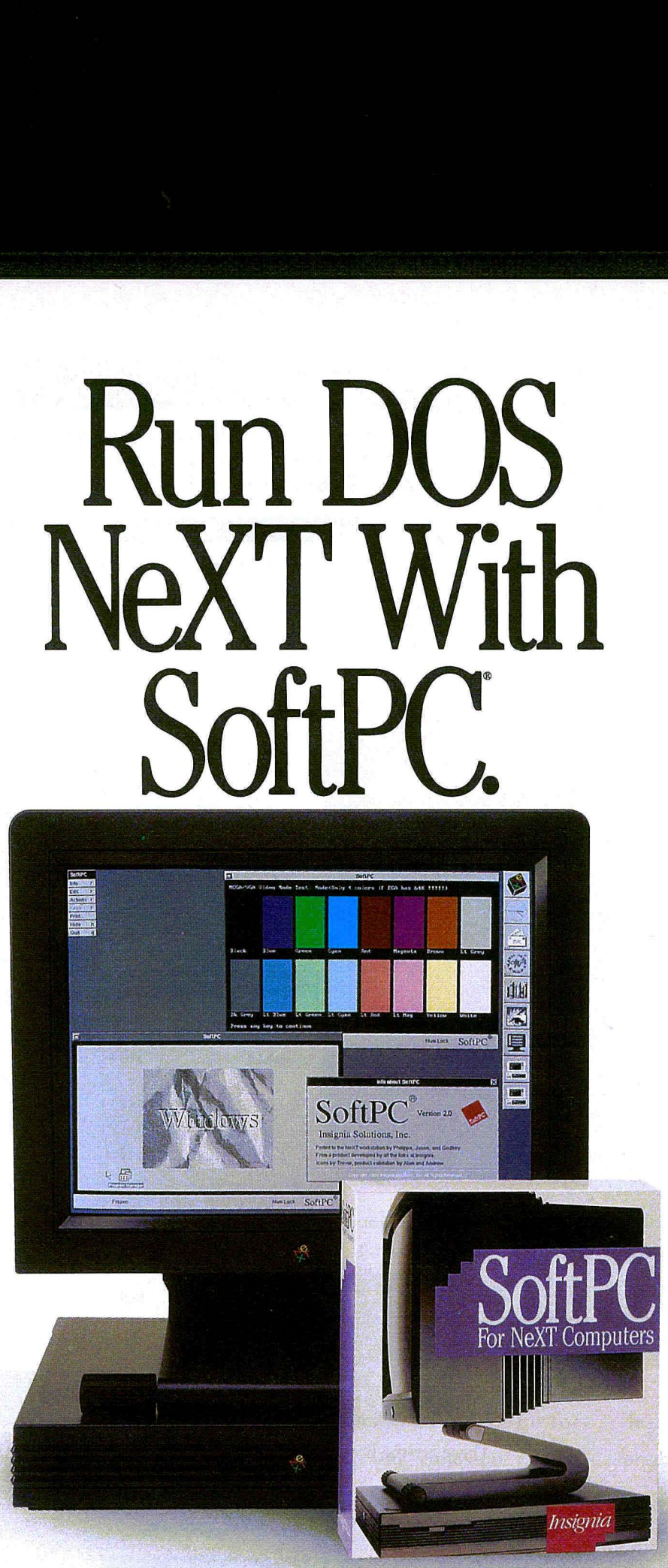
HARDWARE

1 CANON DOUBLE-SIDED OPTICAL DISKS (Canon USA)
2 DOVEFAX FAX/MODEM (Dove Computer)
3 PLI SUPERFLOPPY 2.8 FLOPPY DRIVE (PeripheralLand Inc.)
4 CUBEFLOPPY 2.9 FLOPPY DRIVE (Digital Instrumentation Technology)
5 INTERFAX 24/96/NX FAX/MODEM (HSD Microcomputer US)

SOFTWARE

1 ILLUSTRATOR 3.0 (Adobe Systems)
2 SOFTPC 2.0 (Insignia Solutions)
3 WORDPERFECT 1.0.1 (WordPerfect Corporation)
4 IMPROV (Lotus Development)
5 DIAGRAM 1.1 (Lighthouse Design)

Run DOS NeXT With SoftPC.®



Whether you're a NeXT user who needs to access MS-DOS applications and data, or a PC user who wants what's NeXT without losing what you already have, you can have it all with *SoftPC.*

Run AT and NeXT software side by side. Copy, cut and paste from one to the other. Share files between MS-DOS and NeXT environments.

SoftPC gives you true IBM PC/AT compatibility and performance for your NeXT computer with no added hardware. Everything that's NeXT, plus everything an IBM PC/AT can do, in one machine. EGA graphics, LIM expanded memory and 80287 math coprocessor support. Networking, peripherals, everything.

To order *SoftPC,* just call Insignia at (800) 848-7677. For technical information, call Insignia at (415) 694-7600. In Europe, please call (U.K.) +44 494 459426.

Insignia™

Insignia Solutions Inc., 526 Clyde Avenue, Mountain View, CA 94043. FAX (415) 964-5434.
SoftPC is a registered trademark of Insignia Solutions Inc. All other products are trademarks or registered trademarks of their respective holders.

Circle 3 on reader service card

PRESS CLIPS

Unlike the usual programming method – writing software o line at a time – NeXT's "object-oriented" system offers larg building blocks that developers can quickly assemble the wa a kid builds faces on Mr. Potato Head. Just as desktop pu lishing brought the first Apple Macintoshes into business, fa programming promises NeXT entree, Jobs says. "But th time we're getting invited inside the front door."

JOHN SCHWARTZ, *NEWSWEEK,* NOVEMBER 18, 1991

Jobs will announce in January that his NeXTstep operati system will be rewritten to run on machines powered by In microprocessors. The move pits him squarely against Microso which makes most of the operating systems sold today. But it works, the payoff could be big. "It's the Trojan Horse th will get NeXT into Corporate America," says Jobs.

KATHI REBELLO AND ROBERT D. HOF, *BUSINESS WEEK,* NOVEMBER 18, 1991

As a privately held company, NeXT is not obligated t disclose financial results. Asked whether NeXT is profitabl Jobs indicated it was, but added, "let us be a little more wild profitable, then we'll tell you about it."

ASSOCIATED PRESS, *SAN FRANCISCO CHRONICLE,* OCTOBER 31, 1991

[Marger, Johnson, McCollum & Solowitz Informatio Systems Director Greg] Miller said that the financial cond tion of NeXT does not concern him much because he believ the company's core technologies would get picked up b another vendor should the company sink. "Frankly, I couldn care less if [NeXT] went belly up tomorrow, but I'm su they won't," Miller said. "If they declared bankruptcy, som one would take their technology. There's too much there."

ROSEMARY HAMILTON, *COMPUTERWORLD,* NOVEMBER 11, 1991

If NeXTstep is NeXT's crown jewel, its distribution strateg has been its fool's gold.

GARY ANDREW POOLE, "THE MELLOWING OF NEXT," *UNIX WORLD,* SEPTEMBER 1991.

NEW IN SHRINKWRAP

OCTOBER 1 TO JANUARY 1

DTP/GRAPHICS

CREATE
Full-featured illustration and PostScript manipulation
Stone Design
505/345-4800

FRAMEMAKER 3.0
Complete workstation publishing
Frame Technology Corporation
408/433-3311

PORTFOLIO
Visual palette for graphic images
RightBrain Software
415/326-2974

RIGHTBRAIN RULERS
Floating rulers for aligning and measuring
RightBrain Software
415/326-2974

SCANTASTIC
Color correction; scanner drivers
Second Glance
714/855-2331

TYPEVIEW
Font-previewing utility
Vivid Publishing
415/949-4933

CONNECTIVITY/ COMMUNICATIONS

MORNING STAR PPP
Point-to-point protocol
Morning Star Technologies
800/558-7827; 614/451-1883

3270VISION V.2.1
3270 terminal emulation (new version)
Conextions
508/475-5411

MOTIVA MANAG

BY DAN

	1 H	2 B	3 K	4 W	
8 A	9 G	10 I	11 O	12 Q	
16 W	17 I	18 P		19 K	2
24 C	25 I		26 E	27 P	2
32 S	33 L	34 K		35 B	3
40 B	41 J	42 N	43 P	44 U	4
49 G	50 U	51 A	52 Q		5
	58 C		59 M	60 R	6
65 S	66 J	67 I	68 L		6
73 L	74 K	75 H	76 J		7
81 C	82 A		83 E	84 G	8
89 B	90 O	91 W		92 U	9
97 P	98 V	99 I	100 J	101 A	1
106 C	107 D	108 F	109 X	110 V	1
115 M	116 W		117 Q	118 G	
	123 C	124 G	125 E	126 T	
131 Q	132 X		133 T	134 C	1
	139 F	140 R	141 S	142 O	
146 M	147 B	148 K	149 F	150 P	1

SIMSON00000850

SIMSON00000851

CLIPS

g method – writing software one
ct-oriented" system offers larger
rs can quickly assemble the way
ato Head. Just as desktop pub-
Macintoshes into business, fast
XT entree, Jobs says. "But this
ide the front door."

TZ, *NEWSWEEK*,
ER 18, 1991

ry that his NeXTstep operating
n on machines powered by Intel
s him squarely against Microsoft
rating systems sold today. But it
big. "It's the Trojan Horse that
e America," says Jobs.

ND ROBERT D. HOF,
NOVEMBER 18, 1991

ny, NeXT is not obligated to
ed whether NeXT is profitable
led, "let us be a little more wildly
about it."

SS, *SAN FRANCISCO*
CTOBER 31, 1991

lum & Solowitz Information
ler said that the financial condi-
rn him much because he believes
logies would get picked up by
mpany sink. "Frankly, I couldn't
elly up tomorrow, but I'm sure
they declared bankruptcy, some-
logy. There's too much there."

ON, *COMPUTERWORLD*,
ER 11, 1991

rn jewel, its distribution strategy

"THE MELLOWING OF NEXT,"
SEPTEMBER 1991.

W IN
NKWRAP

TO JANUARY 1

PORTFOLIO
Visual palette for graphic images
RightBrain Software
415/326-2974

RIGHTBRAIN RULERS
Floating rulers for aligning and measuring
RightBrain Software
415/326-2974

MOTIVATIONAL MANAGEMENT

BY DAN RUBY

	1 H	2 B	3 K	4 W		5 N	6 V	7 E	
8 A	9 G	10 I	11 O	12 Q		13 S	14 A	15 U	
16 W	17 I	18 P		19 K	20 N	21 S	22 V	23 R	
24 C	25 I		26 E	27 P	28 O	29 Q	30 A	31 C	
32 S	33 L	34 K		35 B	36 D	37 M	38 K	39 R	
40 B	41 J	42 N	43 P	44 U	45 B	46 P		47 D	48 P
49 G	50 U	51 A	52 Q		53 R	54 W	55 X	56 Q	57 T
	58 C		59 M	60 R	61 G	62 B		63 W	64 O
65 S	66 J	67 I	68 L		69 S	70 V	71 Q	72 F	
73 L	74 K	75 H	76 J		77 R	78 O		79 X	80 V
81 C	82 A		83 E	84 G	85 M	86 O	87 H		88 W
89 B	90 O	91 W		92 U	93 C	94 H	95 K		96 H
97 P	98 V	99 I	100 J	101 A	102 C		103 J	104 D	105 H
106 C	107 D	108 F	109 X	110 V	111 U	112 V	113 X		114 I
115 M	116 W		117 Q	118 G		119 J	120 S	121 L	122 K
	123 C	124 G	125 E	126 T		127 U	128 N	129 J	130 I
131 Q	132 X		133 T	134 C	135 W	136 V	137 K		138 E
	139 F	140 R	141 S	142 O		143 K	144 N	145 V	
146 M	147 B	148 K	149 F	150 P	151 S		152 T	153 U	

HOW TO SOLVE

1. Define "clues," writing definitions in "words" column over numbered dashes.
2. Transfer letters to numbered squares in the grid; green spaces separate words. Punctuation is omitted.
3. When grid is filled in, quotation can be read from left to right. The first letters of the filled-in "words," reading from top to bottom, form an acrostic citing the author's name and the book from which the quotation is taken. SOLUTION ON PAGE 98.

CLUES	WORDS
A. Segregated neighborhood	30 82 101 8 51 14
B. Expertise	62 45 147 35 2 89 40
C. Developers' helpers	106 102 93 134 81 58 24 31 123
D. "—— you come home, Bill Bailey"	104 36 47 107
E. Author's former company	138 26 125 7 83
F. Crawl, in water	108 139 149 72
G. Acropolis metropolis	124 84 9 61 49 118
H. —— doll, carnival prize	75 94 1 96 105 87
I. Dante's ——	10 99 114 130 17 67 25
J. Ten-gallon hat	66 119 76 100 103 41 129
K. Author's occupation	34 148 143 95 19 3 38 74 137 122
L. Wooden slat	73 121 68 33
M. Part of Saxony	146 115 59 85 37
N. Incongruity of events	128 42 20 144 5
O. *Pale Fire* author	11 28 90 78 142 64 86
P. Pickle	46 27 18 97 43 48 150
Q. VAR solution	131 117 56 29 12 71 52
R. Bushes	53 140 39 23 60 77
S. One of the senses	65 13 141 69 21 151 120 32
T. Bowl or plate	126 152 57 133
U. Entourage	111 92 153 44 127 15 50
V. Scholarship	70 136 80 145 98 112 110 6 22
W. Concludes a meeting	16 63 88 54 135 116 4 91
X. Maudlin	79 55 113 109 132

SCANTASTIC
Color correction; scanner drivers
Second Glance
714/855-2331

TYPEVIEW
Font-previewing utility
Vivid Publishing
415/949-4933

CONNECTIVITY/ COMMUNICATIONS

MORNING STAR PPP
Point-to-point protocol
Morning Star Technologies
800/558-7827; 614/451-1883

3270VISION V.2.1
3270 terminal emulation (new version)
Conextions
508/475-5411

USHARE
Mac/NeXT connectivity
Information Presentation Technologies
805/541-3000

MATH/SCIENCE

MAPLE V
Mathematical language
Waterloo Maple Software
519/747-2373

BUSINESS

DATALINK
Connectivity between Wingz and relational databases
Fusion Systems Group
212/285-8001

EXECUTOR-MSW
Microsoft Word emulator for the NeXT
Abacus Research and Development
505/766-9115

REDMARK
Red-lining software
Epitome
615/675-0910

SPEEDDEX
Personal information manager
Information Technology Solutions
312/951-7462

WINGZ 1.1B
Spreadsheet updated for NeXTstep 2.1
Informix Software
415/926-6300

UTILITIES

CO-XIST
X Windows on the NeXT
Pencom Software
512/343-1111

LAUNCHPAD
Document and application launch window
RightBrain Software
415/326-2974

LOCKSCREEN
Screen saver with password security
RightBrain Software
415/326-2974

QUICKSTART
Dock extender
Aurora Software
608/231-3679

TARRE
Backup software
Aurora Software
608/231-3679

LANGUAGES AND TOOLS

OTPROVIDE
Link between Improv and Sybase
Objective Technologies
212/227-6767

PROLOG
The Prolog language
Applied Logic Systems
315/471-3900

PERIPHERALS

DYCAM CAMERA
Digital photography
Prism Technologies
705/523-5528

IRCAM SIGNAL PROCESSING WORKSTATION
Parallel processing board for the Cube
Ariel Systems
908/249-2900

RIO FILM RECORDER
Polaroid desktop film recorder with NeXT software
Talus Corporation
713/556-6007

RUNNINGBACK
Backup utility
Microtech International
800/626-4276

Balancing Act

Leaning back from his programming station at RightBrain Software, Glenn Reid is contemplating the biggest challenge of his unconventional career: He is out to make people forget all about QuarkXPress.

With one ground-breaking NeXTstep application already under his belt and a collection of clever utilities just hitting the market, Reid has the credentials to do it. Having paid his dues in the tech-support and product-marketing trenches at Adobe Systems and NeXT, he has emerged as one of the leading lights among NeXT programmers.

Now RightBrain says it will ship PasteUp, a full-featured page-layout program, this spring. For NeXT users who have been frustrated by the dearth of publishing software since Quark spurned the NeXT platform, PasteUp promises to be all that XPress is. And more.

"People love XPress because of its typographic controls. That's fine if you like typing numbers into dialog boxes. But artists don't want to work that way. They should be able to work directly on the type," Reid says.

With PasteUp, users adjust tracking with a slider rather than in a modal panel. It is a small touch, but typical of the way Reid works. He is proudest not of whizzy features, but of what he calls "mini-breakthroughs." His passion is software usability.

"When software is working right, you shouldn't realize you are working with it," Reid says. "Things that are normally painful should be a pleasure."

One of those pleasures is PasteUp's way of working with multiple layers, an awkward operation in most graphics applications. With PasteUp, you click on any visible piece of an object and it is selected. Rotating objects is painless. Images are dragged around the screen with lightening speed.

For Reid, 30, it is all a matter of balance. You see that in the toys arrayed around his workstation – an arrow for balancing, beanbags for juggling. There is also a jack-in-the-box Einstein and a volume about the life of Michelangelo. A street sign reading "Balance St." hangs on the wall. You also see it in his company's name, a reference to his belief that software should be "associative, not narrow-minded."



RightBrain's Glenn Reid *is about to give NeXT users the page layout program they've been waiting for.*

Reid's career has always been balanced in favor of the user. After a two-year stint writing custom accounting systems in Maine ("For me, the user is a guy in a truckstop in Bangor," he says), Reid set out for California and a job in tech support at Adobe. PostScript had shipped just a month before in the first Apple LaserWriter printers. His first assignment was proofreading the *PostScript Red Book,* which would become the first volume of the PostScript bible.

Soon he was working on font development tools – Adobe's Font Downloader and its first font disk. Then he was assigned to customer service, which he renamed develop support. "PostScript developers were learning the new language. What they needed was help in the form of sample PostScript programs."

By this time, the *Red Book* h been supplemented by the *Blue Book*. What was still missing wa volume of programming example Management approved Reid's pr posal to fill the gap, and six mont later he had finished the *PostScrip Green Book*.

But he was itchy. He wanted write software, and he found that his PostScript knowledge was in high demand on the outside. Mea while, NeXT had begun shipping its first-generation computers wit Display PostScript built in. After meeting Steve Jobs, Reid went to work for NeXT as product manager for interpersonal computing June 1989. At the time, NeXT wa ramping up for Warp 9. Despite being assigned to marketing, Reid managed to work on some periph eral projects related to NeXTstep 2.0, including the chess and fax programs.

But while growing increasingl enamored of the NeXT system, he was less interested in marketing the product than in writing software for it. His small savings from Adobe stock options gave him the opportunity to hole up for three months with his dogs in his house in the Santa Cruz mountains. Thr months to write his first piece of commercial software. He had a lo to learn.

The result was TouchType, a PostScript typography program. The unique thing about TouchType is its use of direct manipulation, allowing users to work direct on type on the screen. Other type programs anchor type to a curve a point. With TouchType, you can put it anywhere.

But Reid wasn't ready to build his own publishing company. He showed TouchType to John Warnock, president of Adobe Systems, who immediately offe buy it. Reid accepted the of February 1991 and went to to consider his options. "I s month on the beach and ca with the urge to start up ag This time, he opened an of downtown Palo Alto and h directors of operations, sale marketing. And he set his s filling the urgent need for a specific page-layout progra

Needing income for Ri while he spent the year dev PasteUp, he cut a deal allo RightBrain to ship custom Adobe fonts. He also shipp screen-saver utility, LockSc which RightBrain acquired shareware author. And he spun off peripheral piec PasteUp, including its inno Rulers feature, and an ima base, as interim products.

As of late November, I was "laid open on the ope table," ready to be compile first beta. Reid says he is st target to ship it in the first 1992. If he keeps to his sch NeXT users can get ready their Quark-bound Macs. of making do with a Maci port, they can look forwar elegant, NeXT-specific pro Software with balance.

by DAN RUBY

PHOTOGRAPH BY VOLDI TAN

PHOTOGRAPHS BY MARY MERRICK

SIMSON00000852

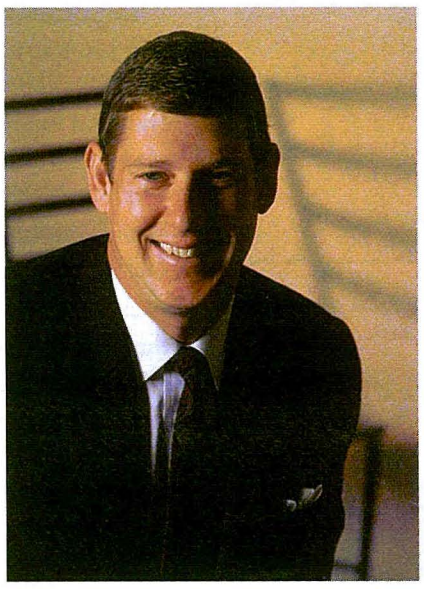
SIMSON00000853



World Conquerors

Garrulous cowboy and smooth European: Max Henry and Theo Wegbrans are as different as two NeXT executives can be. Henry is vice president and general manager of NeXT Pacific Operations, and Wegbrans holds the same title for NeXT Europe. Together they are responsible for the fastest-growing segment of the NeXT universe: the international market.

"Howdy. How can I help?" If you have met Max Henry, this is probably the first thing you heard, a hearty greeting followed by an offer of help. Henry's specialty during his two highly successful stints running NeXT's western operations and its Developer Partnership Group was forging beneficial relationships for NeXT. Now he manages the biggest partnership of them all: Canon and its partners have distribution rights for most of his Pacific area. The company also owns 16 percent of NeXT.



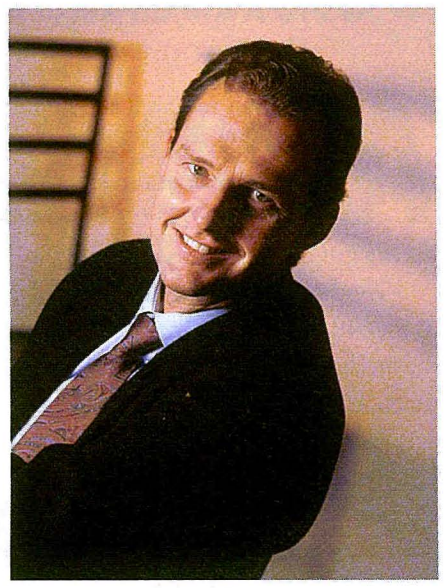
NeXT's Max Henry *says Asia will emerge as the world's number one economic sector.*

A veteran of various sales positions at Datapoint, Wang Laboratories, and U S West before joining NeXT, Henry went to Asia because "it is the emerging part of the world. In 2010 Asia/Pacific will be the number one economic sector of the world," he said. He expects to "[improve] business in excess of 100 percent next year," with a long-term goal of a $1 billion NeXT business in Asia in five years.

Henry thinks many emerging Asian economies will skip right past PCs and minicomputers and go directly to workstations. In developed countries, like Japan, big sales are already in the works, with important recent installations at Osaka University, Yamaha, and a major auto company.

For Henry, the only downside is the constant air miles. While he is attending to the problems and opportunities of the Pacific Rim, wife Merry and two children remain in Alameda, California.

Travel is no issue for Wegbrans, a native of the Netherlands, who speaks four languages fluently. Under his leadership, NeXT Europe has seen a spectacular rise, from almost zero a year and a half ago to almost 40 percent of worldwide sales today. It was a quiet revolution led by a low-key dynamo.



Under **Theo Wegbrans's** *leadership, NeXT Europe has climbed to almost 40 percent of sales.*

Before coming to NeXT, Wegbrans spent his entire career at Hewlett-Packard, joining 16 years ago as a salesman. By 1984, he was sales and marketing manager for Northern Europe. By 1990, he was in charge of workstation distribution in Europe.

At NeXT, his focus has been on localization and distribution. During 1991, fully localized systems have been made available in France, Germany, and the United Kingdom, with several more countries due on line in a few months. Over 100 NeXTCenters offering sales, support, training, and value-added services have sprung up to carry the NeXT product line.

Different personalities, different tasks. The commonality comes when they talk about their employees. Conversations with Wegbrans invariably turn to his treasured people assets. "We hired the best people the European computer industry had to offer," Wegbrans says of his 50-person staff. Meanwhile, Henry thinks of his employees as one more type of partner. "You find the best, give them a goal, and set them loose," he says.

The same applies to NeXT's two world conquerors. They have their goals, and now they've been set loose on the world.

by DAN LAVIN

PHOTOGRAPHS BY MARY MERRICK

: was assigned to customer
which he renamed develope
. "PostScript developers
ırning the new language.
ıey needed was help
ɔrm of sample PostScript
ıs."
this time, the *Red Book* had
pplemented by the *Blue*
What was still missing was a
of programming examples.
ement approved Reid's pro-
fill the gap, and six month
had finished the *PostScript*
Book.
: he was itchy. He wanted t
ftware, and he found that
Script knowledge was in
mand on the outside. Mean
NeXT had begun shipping
generation computers with
PostScript built in. After
; Steve Jobs, Reid went to
ɔr NeXT as product man-
: interpersonal computing ir
'89. At the time, NeXT was
g up for Warp 9. Despite
ssigned to marketing, Reid
ed to work on some periph-
ɔjects related to NeXTstep
luding the chess and fax
ns.
t while growing increasingly
ed of the NeXT system,
less interested in marketing
duct than in writing soft-
ɔr it. His small savings from
stock options gave him the
ınity to hole up for three
; with his dogs in his house
anta Cruz mountains. Thre
; to write his first piece of
rcial software. He had a lot
ı.
e result was TouchType,
Script typography program.
ique thing about Touch-
its use of direct manipula-
lowing users to work direct
e on the screen. Other type
ms anchor type to a curve o
. With TouchType, you can
nywhere.
ıt Reid wasn't ready to build
n publishing company. He

showed TouchType to John Warnock, president of Adobe Systems, who immediately offered to buy it. Reid accepted the offer in February 1991 and went to Hawaii to consider his options. "I spent a month on the beach and came back with the urge to start up again." This time, he opened an office in downtown Palo Alto and hired directors of operations, sales, and marketing. And he set his sights on filling the urgent need for a NeXT-specific page-layout program.

Needing income for RightBrain while he spent the year developing PasteUp, he cut a deal allowing RightBrain to ship custom disks of Adobe fonts. He also shipped a screen-saver utility, LockScreen, which RightBrain acquired from a shareware author. And he spun off peripheral pieces of PasteUp, including its innovative Rulers feature, and an image database, as interim products.

As of late November, PasteUp was "laid open on the operating table," ready to be compiled for its first beta. Reid says he is still on target to ship it in the first half of 1992. If he keeps to his schedule, NeXT users can get ready to retire their Quark-bound Macs. Instead of making do with a Macintosh port, they can look forward to an elegant, NeXT-specific program. Software with balance.

by DAN RUBY

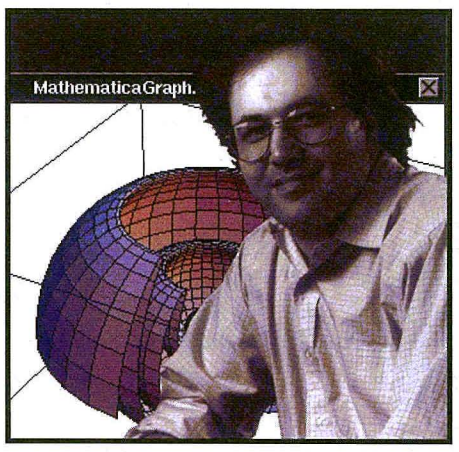
PHOTOGRAPH BY VOLDI TANN

Mathematica Whiz

Stephen Wolfram is a throwback to times when the various fields of science were small enough for a single bright individual to make contributions in several disciplines. A physicist, mathematician, computer scientist, and businessman, Wolfram is best known in the NeXT community as the driving force behind Mathematica, the NeXT's mathematical workbench.

At 32, Wolfram is a soft-spoken man whose true age hides behind wire-rimmed glasses, a receding hairline, and an absolute confidence in himself and his software. The confidence is well deserved, given his successes in academia and business.

Wolfram's path to software entrepreneurship began at Eton and Oxford, both of which he left without degrees or diplomas when he concluded that they had nothing more to teach him. Recruited by Cal Tech on the strength of original physics research he had done as a teenager, he earned his doctorate at the age of 20. He also discovered that most academic scientists were narrow specialists, which conflicted with his wide-ranging interests.



Stephen Wolfram: *From science to business and back.*

After a stop at the Institute for Advanced Study at Princeton University, Wolfram ended up at the University of Illinois, which made him a full professor and director of the Center for Complex Systems. In 1987, he founded Wolfram Research to develop mathematical software for personal computers and workstations.

So is he a businessman or a scientist? "I feel out of place at both the business conferences and the science conferences," he says. "But I blend into the woodwork a little better at the science ones."

Certainly, Wolfram's Mathematica mirrors its creator. The program provides a framework for doing mathematical analysis, either with numbers or symbolically. It is also a graphing system, a general-purpose equation-solver, and, for those who need it, a programming language. The newest version includes support for sound: You can type in the equation for a waveform and Mathematica 2.0 will play it back through the NeXT's internal speaker.

Now that Mathematica 2.0 has been released, Wolfram is starting to look for further challenges. Over the last several months, he has been moving back to science once again. "I'm examining systems that, at a very low level, follow very simple rules but exhibit great complexity when viewed as a whole," he says. Furthermore, he would like to extend the study of these types of complex systems

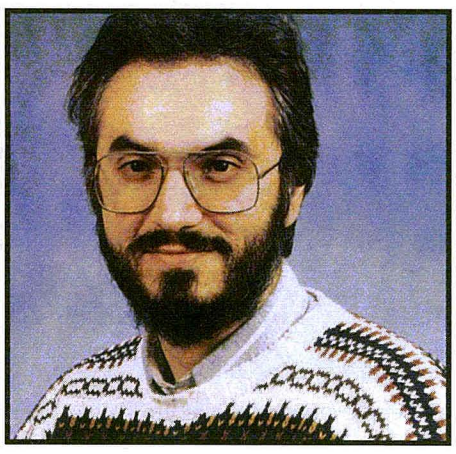
Scientific Methods

Although his research is pointed toward building structures – for anything from a space probe to a submarine – John Michopoulos sees his work at the Naval Research Laboratory (NRL) in Washington, D.C., as applying generally to the scientific method in any discipline.

The 26 NeXTs in the mechanics of materials branch of the NRL are used to compile data on, and simulate the mechanics of, composite materials and metal structures. The simulations can isolate and measure interactions of a material under simultaneous mechanical and thermal loads. NRL researchers use such research for projects like designing a space probe for an environment where it might be affected by solar winds, magnetic fields, or micrometeorites.

NRL researchers are using Mathematica to process research data and automate generation of theories. They also use FrameMaker and Lighthouse Design's Diagram software to represent theories under development in traditional and alternative ways, involving multidimensional graphical representation with algebraic structure.

The NeXTs in Michopoulos's unit are networked to 50 NeXTs throughout the base, as well as to NRL's extensive array of other computer platforms, including IBM PCs, Macs, Suns, VAXes, and a Cray. The network facilitates the electronic transfer of documents; minimizes time for data transfer between various platforms; and provides a distributed, parallel, and user-transparent computing environment, says Michopoulos.



John Michopoulos *saw a parallel between his goal and NeXT's interpersonal computing.*

Michopoulos's system is the result of a long-standing philosophical interest in scientific method, developed through years of training in mechanical and electrical engineering. Michopoulos and his colleagues realize that very expensive computing power typically is spent on improvements in the already-efficient process of number-crunching, while the basically nonresearch-related processes - sharing notes, typing letters, and translating data - are visually done using traditional and somewhat inefficent means.

Since application of rationality is the common process behind these activities, Michopoulos, together with his colleagues, decided that a system providing "amplification of rationality" was needed.

Two years ago, Michopoulos and his colleague drafted an NRL proposal for what they term a "transparent hypermedia facility" to aid scientists in their research. Later, they realized that many of the ideas that led to the computing specifications they established for the facility were similar to those set forth by NeXT President Steve Jobs in describing interpersonal computing.

Perhaps, Michopoulos muses, the ability of his team's rational amplifiers with hypermedia and virtual reality properties will allow a user to navigate through scientific data and create new connections, leading to unique concepts. "We can do much better than just rearranging what we already know."

by STUART SILVERSTONE

Field Reports

Hot topics and goings-on in the NeXT user commu

Threads from the N

Mathematica complaints. A protection mechanism in M matica 2.0 that disallows ar network sharing was the to heated complaints on the N several weeks. Netters felt t was the wrong philosophy f application on an interpers machine like the NeXT. On trated poster went so far as mit a modification program allows readers to bypass the tion – a questionable respon Posters agreed that network allowing sharing are a much solution.

★

Networking by Net readers. the new services offered by on the net these past month regular, extensive reviews of products by independent de in **comp.sys.next.announce,** plement to the less formal – valuable – hardware and so user reviews that have alwa appeared in comp.sys.next. also support each other thro regular appearance of NeX tem patches (one appeared day of the announcement o Other offers of help ranged basic NeXT setup and mair to those of one poster, who circuits for connecting a CD to the DSP port of the NeX Others offered their services announcing remote prograr and user interface design co ing, proving the Net's value source of services and free-opportunities.

★

SIMSON00000854

SIMSON00000855

idy at Princeton Univer-
is, which made him a full
: Systems. In 1987, he
tical software for personal

out of place at both the
," he says. "But I blend
better at the science ones."
Mathematica mirrors its
des a framework for
is, either with numbers or
phing system, a general-
id, for those who need
ge. The newest version
: You can type in the
nd Mathematica 2.0 will
eXT's internal speaker.
:a 2.0 has been released,
for further challenges.
is, he has been moving
"I'm examining systems
llow very simple rules but
e," he says. Furthermore,
of complex systems →

t, says Michopoulos.
-standing philosophical
years of training in
ulos and his colleagues
ically is spent on improve-
-crunching, while the basi-
es, typing letters, and
lly done using traditional
leans.
ationality is the common
ties, Michopoulos, together
d that a system providing
ty" was needed.
opoulos and his colleagues
for what they term a
facility" to aid scientists in
ealized that many of the
iting specifications they
were similar to those set
Steve Jobs in describing

os muses, the ability of his
l virtual reality properties
lata and create new con-
o much better than just re-

Field Reports

Hot topics and goings-on in the NeXT user community

Threads from the Net

Mathematica complaints. A copy-protection mechanism in Mathematica 2.0 that disallows any network sharing was the topic of heated complaints on the Net for several weeks. Netters felt that this was the wrong philosophy for an application on an interpersonal machine like the NeXT. One frustrated poster went so far as to submit a modification program that allows readers to bypass the protection – a questionable response. Posters agreed that network licenses allowing sharing are a much better solution.

★

Networking by Net readers. Among the new services offered by readers on the net these past months were regular, extensive reviews of new products by independent developers in **comp.sys.next.announce,** a supplement to the less formal – but valuable – hardware and software user reviews that have always appeared in comp.sys.next. Users also support each other through the regular appearance of NeXT system patches (one appeared within a day of the announcement of a bug). Other offers of help ranged from basic NeXT setup and maintenance to those of one poster, who offered circuits for connecting a CD player to the DSP port of the NeXT. Others offered their services for pay, announcing remote programming and user interface design consulting, proving the Net's value as a source of services and free-lance opportunities.

★

NeXT has it now. An amusing incident reported by one poster suggests why NeXT's choice of the SmallTalk-like Objective C may have been wise. At a recent conference, a spokesman for the Apple-IBM alliance was describing the new operating system, supposedly based on an existing Apple OS called Pink. Listeners were shocked into silence when they learned that the expected porting and redesign time was as long as three to four years. Finally, when the spokesman went on to mention that the project had adopted C++ as their main language, a heckler's shout of "No wonder it will take so long!" caused general laughter and agreement.

★

The good OD days. Posters continue to extol the virtues of the NeXT printer (indefinite number of fonts, graceful handling of large files, high-quality output, 68040-fast, low cost). But the new floppy drives are faring less well. Reporters complain of extremely slow write and initialization times, non-ejectable DOS floppies, problems with reusing floppies, and the ever-present problem of how to divide up large NeXT apps or multimedia directories into small pieces for SneakerNet uses of the floppies. New, faster, and cheaper OD and CD-ROM drives may help alleviate this problem.

★

Any ports in a storm. Rumors of NeXTstep ports were rife, ranging from the old chestnuts about the HP Snake to some interesting speculation on a Steve Jobs/Bill Gates partnership for using existing Intel machines. A quote from Steve claiming that NeXTstep was running on four platforms (680x0, RS/6000, and perhaps PS/2 and i860?) sparked interest, →

Now Shipping!



Introducing OnDuty™

A new generation of office productivity software that dramatically streamlines the way you work

√ Scheduling
A powerful multi-user calendar manages appointments and to-do items for you and your colleagues. Others can access your schedule without seeing confidential items. Set alarms for any appointment. Attach appointments to names.

√ Names and Contacts
OnDuty gives you a versatile names database. Group names into folders you define, like clients, leads, friends,... Track all appointments, calls, letters, faxes, etc. with your contacts. Look at just your own activity log for a contact or your entire group's.

√ Note Pads
Type in ideas on the fly and organize them in custom note folders. Does a note refer to a document? Drag the document's icon into the note body. Do colleagues work with the data too? Make a shared folder that your group can use as a common bulletin board.

√ Optional Tools
OnDuty allows special tools to be added as separate modules. DIT's first add-on module, coming soon, will allow OnDuty to share appointments, name and reminder data with the Sharp® Wizard™ hand-held organizer.

In today's business world you need easy-to-use, yet sophisticated tools to manage information and schedules. OnDuty is the answer.

Digital Instrumentation Technology, Inc.

127 Eastgate Dr. #20500, Los Alamos, NM 87544
(505) 662-1459 FAX: (505) 662-0897

© Copyright 1991 Digital Instrumentation Technology, Inc. OnDuty, DIT, and the DIT logo are trademarks of Digital Instrumentation Technology, Inc. All other trademarks referenced are the service mark, trademark, or registered trademark of their respective owners.

Circle 10 on reader service card

→ Field Reports

though one reader, frustrated by the indefinite wait for a NeXTstep license, posted news of his own port of a simplified, but mostly complete, AppKit to the Sun. Most exciting was speculation that the licensing of DPS libraries, engines, and fonts by Adobe Systems will allow a whole new slew of client/server applications that use the NeXT as front end. Client programs on non-NeXT platforms could be compiled and linked to the Adobe DPS library and run across the Net, displaying on a NeXT. This allows some benefits of a full NeXTstep license to be achieved without waiting for the paperwork. Most netters doubted that NeXTstep would be licensed, but they continued quoting the old Net saying: "Open up or die."

★

"Free offer"? There is still some ongoing confusion over the various deals NeXT made for new T-shirts, Improv, and free *NeXTWORLD* subscriptions. Compounding this is the ongoing struggle many posters reported in getting the issues of *NeXTWORLD* on time, or at all. Many said that NeXT and *NeXTWORLD* must be made more aware of their promises to their users and their readership, who, while committed, don't have infinite patience.

★

Stats I. Traffic in the various subgroups of **comp.sys.next** has leveled off at a total of about 100 messages per day. About 60 percent of the traffic is still general messages in **comp.sys.next.misc,** the direct descendant of **comp.sys.next,** while the remaining 40 percent is split equally between the programming and system administration groups. Meanwhile, the CompuServe NeXT forum now has more than 200 files available for downloading.

User Group News

NeXTWIRE. The Boston Computer Society NeXT User Group has become a mini-Reuters with its new NeXTWIRE service, brainchild of Dave Pollock. This central database enables user groups to share stories and reviews among local newsletters, replacing the old method of exchanging newsletters by mail and retyping the old news.

★

UPSNYNUG. Up State New York NeXT Users Group, centered at Skidmore College in Saratoga Springs, New York, is deep in music software development. They've recently completed BESSIE 2.0, an advanced version of their interactive tutorial on frequency modulation synthesis.

★

Give a call. SnUG, the San Diego NeXT Users Group, invites users to dial into their active bulletin board, the The Snug Electronic Community BBS. The BBS, in existence for over a year now, has 13 discussion groups. The number is 619/456-2522, and is available 24 hours a day.

★

Stats II. Momentum continues to grow in the user group community. There are now 231 groups worldwide, with new groups in South Korea, South Africa, Israel, Austria, and the United Kingdom. NeXT user groups are in 45 U.S. states and 23 countries, and 120 of these groups have filed applications for the Golden Nugget awards program from NeXT.

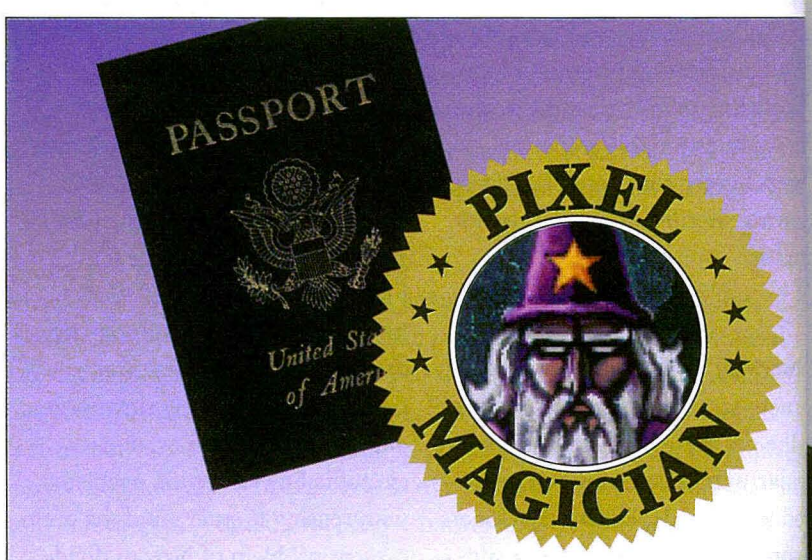
by CHARLES L. PERKINS & DAN LAVIN

→ Mathematica Whiz

to what he calls the softer sciences, where research is starting to become more quantitative in nature. Using the theories of cellular automata and other rules for exploring complex systems, he would like to experiment with models of behavior in biology, psychology, and sociology. And Mathematica is an ideal tool to assist him in his explorations.

By relentlessly pursuing whatever direction his interests take, Wolfram crosses traditional boundaries between disciplines. He feels that Mathematica has helped bridged a gap between academic science and business. "Most academic researchers don't develop their ideas to the point where they' actually useful to others, and see commercial products as inappropr ate for investigation," he explains. "It's gratifying to see Mathematic accepted by both commercial and academic interests as important t their work."

by PETER D. VARHOL



YOUR PASSPORT TO A WHOLE WORLD OF GRAPHICS FILES



Introducing Pixel Magician™, the universal picture file viewer and translator for NeXT computers. Pixel Magician gives your NeXT free reign in the world of computer graphics because it converts images to and from just about any file format – PICT I, PICT II, TGA, PCX, GIF, TIFF, EPS, RAST, BMP, IFF and others.

Pixel Magician lets you view graphic files in different formats, import them and treat them as if they were created directly on your NeXT.

Or export picture created on the NeXT t other platforms in th appropriate file format color map and bit depth

It even work seamlessly through th NeXT Services menu t bring non-native file formats directl into your page layout, word processing drawing, painting and imagin applications.

Pixel Magician from Bäcchus, Inc Your passport to a whole world o graphics files! Call (310) 820-914 today for more information.

Bäcchus, Inc.

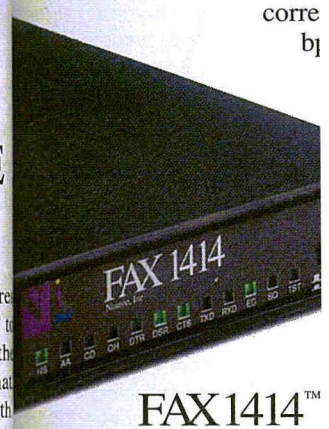
2210 Wilshire Blvd., Suite 330, Santa Monica, CA 90403 E-mail: info@bacchus.com

Circle 24 on reader service card

Th
Or



anc
NeX
softwar
Group III
V.32bis da
bps. Both m
fax specific
from other
streamlin
and MN
corre
b



FAX 1414™
$895

Circle 1 on reader service c

SIMSON00000856

SIMSON00000857

searchers don't develop
is to the point where they're
useful to others, and see
cial products as inappropri-
vestigation," he explains.
ifying to see Mathematica
by both commercial and
c interests as important to
rk."

ER D. VARHOL

XEL
GICIAN

O A WHOLE
HICS FILES



Or export pictures
created on the NeXT to
other platforms in the
appropriate file format,
color map and bit depth.
It even works
seamlessly through the
NeXT Services menu to
non-native file formats directly
ur page layout, word processing,
ng, painting and imaging
tions.
cel Magician from Bäcchus, Inc.
passport to a whole world of
cs files! Call (310) 820-9145
or more information.

nc.
0403 E-mail: info@bacchus.com

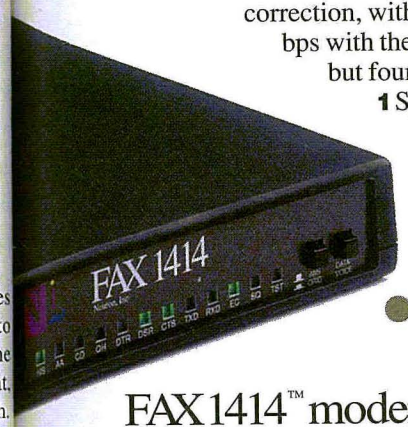
vice card

New! V.17 Fax Support

The best way to get from one point to the NeXT™... ...and it shows!



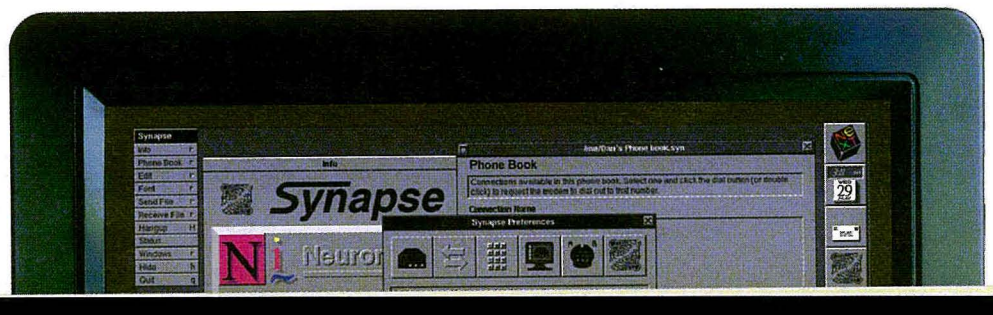
FAX1414+™ modem
$1,095



FAX1414™ modem
$895

At last, the one-step connection between your NeXT and the world has arrived! Designed specifically for the NeXT computer, the Neuron FAX1414™ and FAX1414+™ packages will solve all your NeXT communication needs. Our hardware/software combination provides fully integrated Group III fax send and receive and high speed V.32bis data communications of up to 14,400 bps. Both modems even support the new V.17 fax specification, letting you send to and receive from other V.17 fax machines at 14,400 bps. Enjoy streamlined data interchange with the latest V.42bis and MNP5 standards in data compression and error correction, with throughput of up to 76,800 bps (57,600 bps with the FAX1414). On top of this, we bundle not one but four software applications, each with extensive capabilities: **1** Synapse™, our lightning-fast, efficient and reliable VT100/VT52 terminal-emulation software with the latest in file transfer capabilities and point-and-click building of login scripts; **2** EasyMail™, a one-step UUCP installer which will quickly set up your Portal Communications account on the Internet; **3** Neuron Monitor™, an application which will automatically show the status of the modem regardless of where it is on the network; **4** our reliable fax driver, seamlessly integrated into the NeXT print command. FAX1414 and FAX1414+ even use sophisticated signal-detection technology to make incoming call handling transparent, automatically launching and directing a call to the proper fax or data communications process. In addition to this, the FAX1414+ offers 4-wire leased line capability, complete with direct front-panel programming. So with such great features, list prices of $895 and $1.095*, a two-year warranty, and our 30-day satisfaction money-back guarantee, shouldn't you give us a call?
800.727.7538 • 609.452.1100 • 609.452.8495 (fax)

*Educational, Developer and quantity discounts are available. FAX1414, FAX1414+, EasyMail, Neuron Monitor and Synapse are



Neuron, Inc.
125-240 Village Blvd
Princeton NJ 08540

Circle 1 on reader service card

The application everyone's been whispering about has arrived.



It's NeXTstep™ at its best.

For a personal demonstration, please stop by our booth at the NeXTWORLD Expo, January 22-24, 1991.

For ordering information, please call NeXTConnection™ 800-800-NeXT or 603-446-3383

LIGHT™ HOUSE DESIGN
301 907-4621
800 366-2279
301 913-2806 fax

© 1992 Lighthouse Design, Ltd. All rights reserved. The Lighthouse Design logo and the Concurrence logo are trademarks of Lighthouse Design, Ltd. All other trademarks are the property of their respective owners.

Circle 30 on reader service card

NEXTWORLD

NEWS IN BRIEF

Informix Software released in December Version 1.1A of Wingz for the NeXT. The new version is certified to work with NeXTstep Version 2.1, without the bugs customers encountered using the unsupported Wingz 1.0 under the newest version of the operating system. Wingz also now supports color, integrated faxing, and floppy disks. The new version is otherwise identical to the original and does not represent a significant upgrade. Informix Software: 800/438-7627.

Adamation and the management firm of Booz, Allen, Hamilton have won the competition to produce custom software for the Los Angeles County Sheriff's Department installation. The 40 applications will be based on Adamation's custom software library and the company's shrinkwrapped products, Who's Calling and Live Wire. The contract is reportedly worth close to $2 million over the course of the next year.

Box Hill Systems has announced availability of its entire product line on the NeXT platform. The company markets mass-storage and network-backup products, including hard disks from 200MB to 8GB and tape backups from 150MB to a whopping 500GB. Box Hill also markets RAM for NeXT machines. Box Hill Systems: 800/727-3863, 212/989-4455.

Mug shot management is now available to police departments using NeXT through RICI-MUG from Comnetix Computer Systems. Early customers of the technology include the Toronto Metro and York Regional Police Departments in Ontario, Canada. Comnetix is currently shipping the product in three modules – booking, witness viewing, and investigation – though it plans to expand into all areas of police imaging. The company also hopes to revolutionize police software by offering the software as low-cost

[CONTINUED ON PAGE 4

SIMSON00000858

SIMSON0000085 9

TM

its best.

o by our
22-24, 1991.

TConnection™

K

ighthouse Design logo
Design, Ltd. All other

NEXTWORLD EXTRA JANUARY 1992

NEWS IN BRIEF

Informix Software released in December Version 1.1A of Wingz for the NeXT. The new version is certified to work with NeXTstep Version 2.1, without the bugs customers encountered using the unsupported Wingz 1.0 under the newest version of the operating system. Wingz also now supports color, integrated faxing, and floppy disks. The new version is otherwise identical to the original and does not represent a significant upgrade. Informix Software: 800/438-7627.

Adamation and the management firm of Booz, Allen, Hamilton have won the competition to produce custom software for the Los Angeles County Sheriff's Department installation. The 40 applications will be based on Adamation's custom software library and the company's shrinkwrapped products, Who's Calling and Live Wire. The contract is reportedly worth close to $2 million over the course of the next year.

Box Hill Systems has announced availability of its entire product line on the NeXT platform. The company markets mass-storage and network-backup products, including hard disks from 200MB to 8GB and tape backups from 150MB to a whopping 500GB. Box Hill also markets RAM for NeXT machines. Box Hill Systems: 800/727-3863, 212/989-4455.

Mug shot management is now available to police departments using NeXT through RICI-MUG, from Comnetix Computer Systems. Early customers of the technology include the Toronto Metro and York Regional Police Departments in Ontario, Canada. Comnetix is currently shipping the product in three modules – booking, witness viewing, and investigation – though it plans to expand into all areas of police imaging. The company also hopes to revolutionize police software by offering the software as low-cost [CONTINUED ON PAGE 4]

'486 yields ample speed for NeXTstep

by SIMSON L. GARFINKEL

Exactly what kind of performance NeXTstep will deliver to users of Intel '486 machines will depend on the quality of the port. But according to chip engineers, '486 users will get roughly the same speed as users of existing NeXTstations, except for certain screen-oriented tasks that may be more sluggish.

"What we have found typically is that a 25MHz '040 compares very favorably with a 33MHz '486," said Roy Druian, manager of the 680x0 marketing and applications group at Motorola. "The benchmark numbers turn out to be just about the same. They are within a percent of each other."

The 25MHz 68040 is slightly faster than the 33MHz '486 on floating point, achieving 1.69 MFLOPS (million floating-point operations per second) on the LINpack (Linear package) benchmark, compared with 1.54 MFLOPS for the '486, said Druian. But, he added, the 33MHz [SEE NEXTSTEP, NEXT PAGE]

Expo sets the stage for third-party surge

by DAN LAVIN

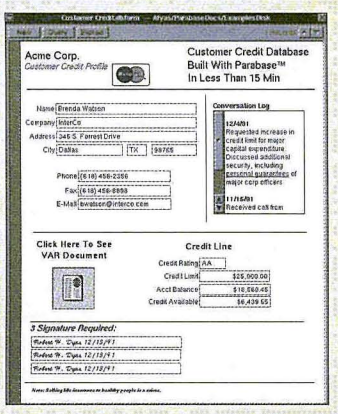
San Francisco – Telecommunication, storage, utility, and database products were expected at press time to lead the surge of new products and services announced at *NeXTWORLD* Expo. Unlike previous events at which NeXT also announced new products, few of the third-party products were to come from major names in the computer industry, instead coming from small developers that are NeXT's mainstays.

The surge is related to NeXT's perceived momentum in the marketplace, and the special opportunity presented by the Expo, according to Chuck Milliken, supervisor of the NeXTConnection mail-order outlet. "A lot of these companies are seeing that NeXT is reaching a larger market. People had these products under development for a long time and were waiting for the right time to release them," he said.

"We had a focused effort to double the number of shipping products in 1991. In fact, we quadrupled them, to 260," said Donna Simonides, NeXT's director of developer partnerships. "We made special efforts in database, utilities, and telecommunications," she said.

• Database products and tools are finally on the front burner with the shipment at Expo of Stone Design's flat-file DataPhile, DataLink for Oracle and Sybase by Fusion Systems Group, SQLCommander from Softsystems, and Parabase from IP Design (see "Parabase plugs database void," below).

• Utility and game programs are perhaps the best indicator of developer interest. Included are dock extenders from RightBrain Software and Aurora Software; the Portfolio image manager from RightBrain; screen savers from several companies; graphics utilities and fonts from Shapiro, Gilmore Studios, and LaserTech; and an HP-style calculator from Trakis. MetroTools from Metrosoft combines a screen saver with utilities to decompress files, import Macintosh fonts and sounds, find files, and launch programs. Bäcchus's Pixel Magician has been hotly anticipated by those needing to wrestle with differing graphics formats. On the entertainment [SEE EXPO, PAGE 4]



IP Design's Parabase is expected to be among the highlights of *NeXTWORLD* Expo.

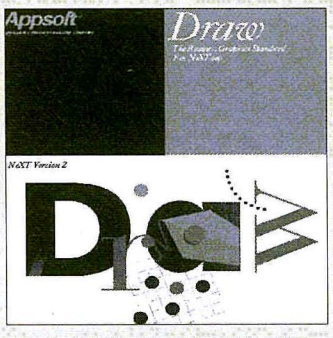
Appsoft gets TopDraw rights

by CLAIR WHITMER

Palo Alto, CA – Appsoft Corporation recently announced that it has acquired exclusive publishing rights for the TopDraw graphics program developed by Media Logic, as well as rights to publish the NeXT-developed graphics animation program, Oscar.

Appsoft said it expects to ship a new version of TopDraw, to be called Appsoft Draw, in February. The new program will feature multiple pages, a master-page/layering capability, a spelling checker, and support for the NeXT color interface. The interface also has been tweaked to match other products in the Appsoft lineup.

Appsoft Draw will sell for $395. Users who bought TopDraw 1.0 or 2.0 between July 1, 1991, and [SEE APPSOFT, PAGE 4]



Appsoft said it will release Appsoft Draw, formerly Media Logics's TopDraw, in February.

Insight debuts doc manager

by ERIC J. ADAMS

Portland, OR – Insight Software hopes to give NeXT document-management software a shot in the arm with an electronic-filing and document-management program called ElectroFile, scheduled for release in March 1992.

The program will allow single or networked users to catalog, index, sort, annotate, select, and retrieve an unlimited number of text or graphics files, according to Samuel A. Van Vactor, Insight's president.

Files in multiple libraries can be classified by title, author source, subject, date, recipient, notes, actual [SEE ELECTROFILE, PAGE 4]

Parabase plugs database void

by ELIOT BERGSON

San Francisco – The NeXT database market is finally heating up, as IP Design puts the finishing touches on Parabase, its long-awaited Sybase front end.

Parabase, which is 100 percent compatible with Sybase 4.0, was designed as a "soup-to-nuts database," according to Robert Dyas, Parabase's developer. Users can drag fields from other applications and databases; use object wells to store images, FrameMaker documents, and spreadsheet models; and generate full graphical reports, he explained. Parabase is priced at $695.

In contrast to DBKit, which is designed for programmers and which NeXT plans to bundle with its upcoming NeXTstep 3.0 release, Parabase is "designed as a front end that [SEE PARABASE, PAGE 4]

ANALYSIS

ISDN-Kit launches NeXT into communications future

But despite all the industry talk and the efforts of vendors like NeXT, for most telephone customers ISDN is likely to remain only a promise for at least another year.

by SIMSON L. GARFINKEL

With NeXTstep 3.0, NeXT will dramatically strengthen its commitment to interpersonal computing by including the company's long-anticipated PhoneKit and ISDN-Kit.

PhoneKit will allow any NeXT computer, with a relatively small amount of additional programming, to become a full-featured voice-mail system. The kit will allow a NeXT to place or receive telephone calls, generate and decode touch-tone signals, as well as play and record voice over the phone line. The NeXT computer will connect to the telephone through the DSP (digital signal processor) port using a third-party interface expected to cost about $200, according to Kevin Wells, manager of software products.

But the real excitement in Redwood City, California, surrounds ISDN-Kit, NeXT's long-anticipated move into the world of digital telephony through ISDN (Integrated Services Digital Network).

ISDN is a system for using digital signals to deliver sound over telephone lines, much as compact discs use digital signals to deliver music. And just as NeXT's new CD-ROM player brings the power of digital music to the service of computer users, NeXT's ISDN interface will let its user transmit large amounts of information cheaply and quickly over wide areas.

When attached to a digital telephone line, the third-party telephone interface will allow NeXT computers to send and receive information at rates between 64 and 128 kilobits (Kbits) per second.

NeXT's ISDN-Kit will allow the system to place and receive data calls over an ISDN telephone line. NeXTstep 3.0 also will include software, such as SLIP (Serial-Line Internet Protocol) or PPP (Point-to-Point Protocol), to allow full Internet connectivity over these connections, Wells said. The third-party adapter box will include a jack for an analog (conventional) telephone to allow normal telephone operations.

RBOCS RAMP UP ISDN EFFORTS

RBOC	Year	Lines with Access to ISDN	Percent of Total Lines
Ameritech	1991	2,200,000	
	1994	14,000,000	87
Bell Atlantic	1991	6,900,000	
	1994	17,100,000	90
Bell South	1991	3,100,000	
	1994	10,500,000	52
NYNEX	1991	2,100,000	
	1993	4,100,000	26
Pacific Bell	1991	3,740,000	
	1994	7,500,000	50
Southwestern Bell	1991	1,127,000	
	1994	4,421,000	32
U S West	1991	3,000,000	
	1994	7,300,000	51

The potential of ISDN

The biggest impact of ISDN will probably be for people "working at home," said Eric Bergerson, managing director of Objective Technologies, a New York NeXT developer that caters to the financial community. Even ISDN's slowest speed — 64Kbits per second — is more than four times the speed offered by today's fastest modems. ISDN would therefore allow a NeXTstation at a person's home to "really be an extended part of the [office] network," said Bergerson.

For example, a stock trader using ISDN could access trading systems and databases as easily from a NeXTstation at home as she could from a NeXTstation on her office desk, Bergerson said. "In our industry, people [want] to do that all over."

Already, NeXT's Wells uses ISDN from his home to access his files and electronic mail at NeXT's Redwood City headquarters.

In Europe and Japan — two of NeXT's principle sales areas — national phone companies have already invested heavily in both ISDN equipment and services, according to Robert Toense, vice chairman of the applications software interface group of the North American ISDN Users Forum. "ISDN is very prevalent in France. Europe in general has a lot of ISDN," he said.

NeXT isn't the only workstation vendor that's developing a product for the new technology. Sources inside Sun Microsystems report that the company is developing an S-bus ISDN card for the Sun SPARCstation and has a worldwide effort aimed at developing ISDN applications and integrating ISDN into Sun's operating system.

How it will work

By creating a digital channel between the customer and the phone system, ISDN opens the possibility for exchanging information at speeds much faster than is possible with even today's fastest analog modems.

Basic-rate ISDN provides for two 64Kbits/sec channels and one 16Kbits/sec channel between the subscriber and the central office over a pair of twisted wires. Primary-rate ISDN provides for 23 "B" channels, for a combined bandwidth of 1.5 megabits per second over the same twisted pair. Using fiber-optic links, broadband ISDN can provide subscribers with data rates from 50 megabits to 2 gigabits per second.

Initially, NeXT will support only basic-rate ISDN. Telephone customers who subscribe to basic-rate ISDN would use the same pairs of twisted copper wires for phone service that they use today. To make use of ISDN, ISDN-equipped central offices must be present at both ends of the phone call. Sending the data long distance requires that the long-distance carrier be ISDN-capable.

Last February, Bellcore issued "National ISDN-1," a set of services and guidelines designed to end the confusion and incompatibility in the U.S. telecommunications market surrounding ISDN. At the time, the three major telephone-switch vendors – AT&T, Siemens, and Northern Telecom – signed an agreement to implement the National ISDN-1 specification, said Bellcore's Kaufman. Other agreements are forming with the nation's long-distance carriers to allow users to transmit ISDN from city to city.

But despite all the talk of ISDN, for many telephone subscribers it is likely to remain a promise just out of reach for awhile. "Most of the software in most of the switches does not support ISDN," said Toense. "To get the full-blown service, it is going to take a lot of work."

NeXTstep [CONTINUED FROM PREVIOUS PAGE]

'486 achieved slightly better performance than the 25MHz '040 on some benchmarks.

Where the NeXTstation is likely to outshine an Intel-based workstation is raw screen performance, which affects scrolling and animation performance. That's because all the memory on the NeXTstation's screen is memory-mapped. Very few '486-based computers have memory-mapped screens.

A memory-mapped screen allows the computer's CPU direct access to any pixel on the screen. This dramatically speeds the performance of Display PostScript drawing operations, but also the cost of designing and manufacturing the video subsystem.

But whether raw CPU performance will translate to a high-performance implementation of NeXTstep is anybody's guess.

"I wouldn't want to say" what performance would be like, said William Swearingen, head of advanced systems engineering at CompuAdd Corporation, in Austin, Texas. The speed of the software will depend on "who did the port. It could have been done extremely efficiently, or it could be a kludge."

For example, said Swearingen, SunSoft, which markets Sun Microsystems's Solaris operating system, recently purchased Interactive Systems because Interactive's version of UNIX for the Intel '386 and '486 was better than the version Sun had developed in-house for its failed 386i workstation.

The real advantage of supporting the Intel platform might become apparent with tomorrow's microprocessors rather than today's. Intel's next-generation microprocessor, code-named "P5," will be the company's first super-scaler implementation of its successful architecture. A super-scaler implementation would allow the microprocessor to execute several instructions, in parallel, in different execution units for dramatically improved performance.

Intel plans to have engineering samples of the P5 available in the middle of 1992 and be in production by the second half of the year, when the chip will be released under the trademark 80586. Initially, the chip will be only in premium systems, giving them a speed of "100 Dhrystone MIPS. The company expects it to be distinctly superior to Mips Computer Systems's R4000," according to Bruce Schechter, an Intel engineer.

The Motorola 68050, meanwhile, is likely to contain only minor performance improvements over the 68040 as well as higher integration, allowing for reduced system cost. Motorola will not be moving to a super-scaler implementation of its 680x0 architecture until it releases the 68060, which is not expected to hit the market for at least two years.

By that time, Motorola will be marketing the Power PC family of microprocessor chips, part of the company's collaboration with Apple and IBM. The anticipated performance and variety of Power PC chips may steer companies away from using the 68060 in new workstation designs.

B U

NeXT intelligen
help from DEC a

by STUART SILVERSTONE

Reston, VA – Digital Equipment Corporation's announcement it plans to service intelligence-secure NeXT computers, and a joint agreement between NeXT and Jane's Information Group to publish on-line equipment catalogs for military and intelligence applications, highlighted the recent NeXT Federal Expo here.

About 1600 government workers from about 20 civilian, defense, and intelligence agencies – perhaps half already using the NeXT platform – attended vendor presentations, success-story seminars, and a keynote address by CEO Steve Jobs.

In his keynote, Jobs contended that federal government and corporate users have discovered NeXTstep for developing "mission-critical custom applications" that perform tasks five to ten times faster than on other platforms. "We've redone our whole business strategy to focus on that," he said.

BTG, a partner in developing Jane's text and graphics databases on the NeXT, demonstrated a prototype of Jane's Fighting Ships on the new service, which was created with NeXTstep in only three days. "We couldn't have done such rapid prototyping in that time on our usual development tools, other UNIX workstations running windowing environments," said David Holtzman, a technician at BTG. Jane's and BTG chose the NeXT

S

As NeXT continues to pur

Customer	A
ITESM Monterrey, Mexico Largest private university in country	E
Unnamed "three-letter" federal agency Washington, D.C. Government	R
City of Baltimore Baltimore, Maryland Municipal government	D D

SIMSON00000860

SIMSON0000861

NeXT intelligence users get help from DEC and Jane's

by STUART SILVERSTONE

Reston, VA – Digital Equipment Corporation's announcement it plans to service intelligence-secure NeXT computers, and a joint agreement between NeXT and Jane's Information Group to publish on-line equipment catalogs for military and intelligence applications, highlighted the recent NeXT Federal Expo here.

About 1600 government workers from about 20 civilian, defense, and intelligence agencies – perhaps half already using the NeXT platform – attended vendor presentations, success-story seminars, and a keynote address by CEO Steve Jobs.

In his keynote, Jobs contended that federal government and corporate users have discovered NeXTstep for developing "mission-critical custom applications" that perform tasks five to ten times faster than on other platforms. "We've redone our whole business strategy to focus on that," he said.

BTG, a partner in developing Jane's text and graphics databases on the NeXT, demonstrated a prototype of Jane's Fighting Ships on the new service, which was created with NeXTstep in only three days. "We couldn't have done such rapid prototyping in that time on our usual development tools, other UNIX workstations running windowing environments," said David Holtzman, a technician at BTG. Jane's and BTG chose the NeXT "because of the advantages inherent in its object-oriented system software, and its superior performance for real-time communication in both wide- and narrow-area network applications," according to their joint statement.

Peter Hatfield, federal marketing manager for DEC, called DEC's joint agreement with NeXT "the beginning of a relationship that potentially could hold much in store for both our companies."

Attendee reaction was guarded, however, with Mitchell Alland, a division manager at the International Finance Corporation, identifying the NeXT's lack of a good standard spreadsheet as the reason his World Bank affiliate recently purchased Macs in response to user pressure to deviate from MS-DOS.

"The NeXT has some excellent pluses, but the gap is still software, it's still wait-and-see," added Judy Joy, a desktop publisher frustrated with the Mac and considering "jumping ship to the NeXT."

Admitted Jobs: "The biggest thing holding us back is that we haven't done a good enough job getting the word out about what we have. It's a sales and marketing problem."

As a result of the enthusiastic turnout, NeXT plans Federal Expo to be an annual event, moving it to the downtown Washington, D.C., area next year.

Perot leaves NeXT board

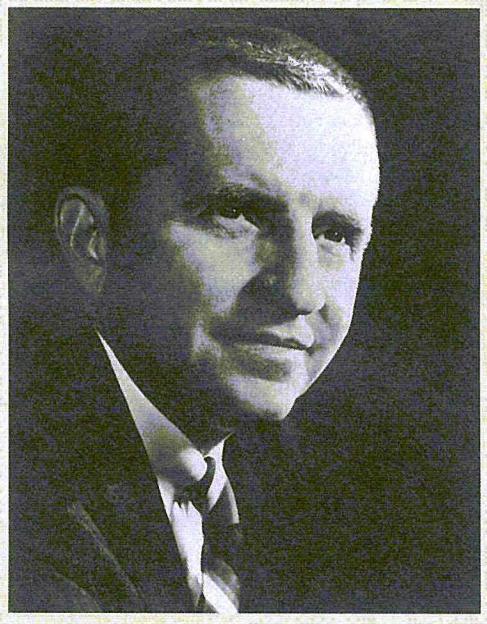
BY DAN LAVIN

Redwood City, CA – In a major reorganization reflecting NeXT's ambitious growth plans, Texas entrepreneur H. Ross Perot and John F. Crecine, president of Georgia Tech University, resigned recently from NeXT's board of directors.

The departures leave only two members of the board remaining: NeXT CEO Steve Jobs and Hisashi Sakamaki, general manager of Corporate Planning of Canon Japan. Jobs is attempting to revamp the board from a small advisory group meeting quarterly into a larger, more dynamic organization meeting monthly, according to a NeXT spokesperson. Jobs plans to staff the board with business representatives experienced in the problems faced by young, growing technology companies such as NeXT.

Perot, one of NeXT's most high-profile supporters, said the rapid growth of his Dallas-based Perot Data Systems has left him no time for a more active role in the company. "I'm not one for meetings anyway," he added. "I speak at short intervals with Steve on the telephone, and I think the company is going in the right direction." The NeXT spokesperson stressed that Perot remains committed to NeXT and plans to retain his 16 percent stake in the company.

Crecine's resignation reflects NeXT's continued emphasis on the commercial, rather than higher-education, market. In addition, Crecine took the board post while at Carnegie Mellon University, an investor in NeXT, but since then has moved to Georgia Tech University, an organization with only distant ties to the company.



Texas industrialist H. Ross Perot recently resigned from NeXT's board but maintains his 16 percent share of the company.

Industry observers were unconcerned by the resignations. "They have a lot of strategic issues to look at as they go public," said Vinod Khosla, a general partner of Kleiner, Perkins, Caulfield, & Byers, a venture capital firm located in San Francisco. "It makes a lot of sense to go to monthly board meetings. It would be usual for out-of-town members to drop off as the board becomes more active."

HSD continues surge in scanners

by CLAIR WHITMER

Mountain View, CA – Amply demonstrating its pride as a profitable NeXT developer, HSD is planning to introduce two new scanners; a rewritten version of its Scan-X software, the OCR Servant Professional character-recognition package; and two new "secret" utilities.

HSD already has carved a niche for itself as one of a handful of companies to offer NeXT-specific scanner hardware and software, including the 8-bit-grayscale Scan-X Professional and the 24-bit Scan-X Color. The company also recently acquired Abaton's InterFax 24/96, now renamed FAXMaster.

HSD will supplement its current scanner offerings with a high-speed scanner capable of scanning 20 pages per minute and a 30-bit color scanner with a native resolution of 600 by 1200 dpi. Both scanners will cost less than $10,000 and will ship in the first quarter, according to company CEO David Peters.

Each HSD scanner includes Spectrum Enhancement, a scanner-engine enhancement that allows the user to fine-tune the range of the scanner's color recognition.

The utility products will be accessories for the hardware line, although no details were available at press time. The OCR Servant Professional package is being added as the high-end complement to the OCR Servant utility.

Originally backed by HSD Germany, HSD started out in January 1989 with the goal of focusing on the NeXT market. "This is our chance to be a big fish in a small pond," said Peter.

The company has been profitable since day one, although it initially had to rely on its Macintosh product line. Since the release of new NeXT hardware and NeXTstep 2.0 last January, however, sales have climbed more than 300 percent. All new research efforts are now directed toward NeXT.

Peter attributes the success of the NeXT line to the company's proprietary firmware as well as dedication to the dealer channel.

"We absolutely will not sell our product through mail order. Other NeXT developers might enjoy more success if they stood behind the dealer channel too," said Peter.

Sales Watch

As NeXT continues to gain market share, we'll keep track of some of the larger purchases by corporations and institutions.

Customer	Application	# of Units	Major Software
ITESM Monterrey, Mexico Largest private university in country	Electronic mail to link 26 campuses nationwide; development of remote classroom and study system	32 100 (1992)	Bundled system software, custom applications, MediaStation, Improv
Unnamed "three-letter" federal agency Washington, D.C. Government	Research	1500	Productivity and graphics applications
City of Baltimore Baltimore, Maryland Municipal government	Dept. of Finance: Office support; Dept. of Transportation: Office support and tracking of parking ticket revenue	34 100 (1992)	Improv, WordPerfect, Diagram

BRIEFS Continued

shrinkwrapped products rather than as an expensive integrated solution. Comnetix: 416/274-4060.

Ragnarok, Twilight of the Gods, is an animated strategy board game based on ancient Viking rules. The newly shipped product comes from David Jeorg Productions of Cambridge, Massachusetts. It includes full-color multi-user network capability; users can also play against various built-in computer opponents. The software is available for $49.95. For information or to place an order, please call NeXTConnection: 800/800-6398.

Stealth Technologies has released an 18-bit digital audio interface board for communication with standard digital audio tape (DAT) recorders, as well as D/A and A/D functions at 32, 44.1, and 48KHz. The price of the board, called the ADA1800 Digital Audio Interface, is $295. Stealth Technologies: 618/692-2769.

Direct editing of non-ASCII files has been simplified with the release of HexEditor from Scheiber Consulting. Users can view the raw hexadecimal binary of a file alongside its ASCII equivalents. The program is available for $35. Scheiber Consulting: 312/363-6420.

Special fonts for science and electrical work have been released by Paragon Concepts. The collection of nine fonts is in two packages: SciFonts and ElectroFonts. Both are available now for $139 each, including manual and keyboard layout. Paragon Concepts: 800/922-2993.

NeXTWORLD Extra **is a supplement of *NeXTWORLD* magazine. It is published monthly by Integrated Media, a subsidiary of IDG Communications, 501 Second St., San Francisco, CA 94107, and is distributed free to subscribers of *NeXTWORLD*. Lt. Sullivan's column and articles about unannounced NeXT products are reported and written by contributors without guidance from the *NeXTWORLD* staff.**

Editor: Dan Ruby; Managers: Darcy DiNucci, Laurie Flynn; News Editor: Dan Lavin; Staff Writer: Simson L. Garfinkel; Layout: Sue Troy; Copy Editor: Eliot Bergson

Expo

[CONTINUED FROM PAGE 1]

front, Ragnarok is an innovative strategy game from David Jeorg Productions.

• Information-management software packages, like the long-awaited OnDuty from Digital Instrumentation Technology, are making their debut, along with SpeedDeX from Information Technology Solutions, ElectroFile from Insight Software (see "Insight debuts doc manager," Page 1), and MindOverMail from Salt Spring Technical. Office needs are being addressed as well with Fiscal Dimension from Axsys, Datrix5 Accounting from Datrix, and forms-management software from Ensuing Technologies. Epitome is expected to announce shipment of its Redmark document-comparison program.

• Mass-storage options are multiplying with expected new drives from PLI, Box Hill Systems, CORE International, ETC Peripherals, and Ten X Technology. NeXTConnection's Milliken sees heavy demand for DAT and optical-backup technologies such as those offered by PLI and Maynard Electronics. Several backup utilities are also arriving on the scene to complement the hardware.

• Telecommunications interest is booming as a result of NeXT's support for ISDN in NeXTstep 3.0. Leading the way is Hayes Microcomputer Products's ISDN adapter to serve as a hardware gateway for ISDN software applications. SES Computing updated its At The Beep answering machine software to include a caller ID option. I-link from Germany will show Mix, its DSP-based telephone and fax system, and Quest is expected to unveil its CallLink automated phone-answering system. Software Ventures is due to announce shipment of its hotly anticipated Microphone II.

See the News Briefs in this issue and the *NeXTWORLD* Expo special issue for contact information about these products and companies.

ElectroFile

[CONTINUED FROM PAGE 1]

text, identification number or code, and date of entry. Users can retrieve files by searching selected indexes or by browsing through libraries.

"We see our target market as the legal, medical, and accounting firms; the government; and graphic design companies – any NeXT enterprise that has many electronic or non-electronic files that must be regularly sorted and retrieved by many users," said Katherine Beers, director of marketing at Insight.

Now in beta testing, ElectroFile will retail for $395 for a single-user version and $895 for a five-user network version.

Insight Software can be reached at 3004 S.W. First Ave., Portland, OR 97201. 503/222-2425, 503/222-0257 fax.

Parabase

[CONTINUED FROM PAGE 1]

can be used to create custom database apps without programming," said Dyas. "Users can hook up 100 or 200 users and it still blazes." Two other databases for the NeXT — DataPhile, a flat-file database from Stone Design, and DataLink for Oracle and Sybase by Fusion Systems Group – are also just hitting the market.

IP hopes that the word-of-mouth support will blossom into big sales at the *NeXTWORLD* Expo. Powerful, user-friendly database front ends are the wave of the future, Dyas explained. "It's where everybody is going, but we have it here today," he added.

Appsoft

[CONTINUED FROM PA

November 20, 1991, can up for free.

Appsoft executives declin discuss specific features or a date for Oscar, and compan President Randy Adams con Appsoft may even decide no ship the product. Appsoft d not have exclusive rights to leaving NeXT open to nego tions with other developers.

Oscar's author, NeXT gr designer/programmer Keith said that the version of Osca within NeXT is modeled aft MacroMind Director for the intosh. It includes a Script w for designing individual fram and a Stage window for play back the frames. TIFF or EP can be imported and stored mation objects called Cast M bers. It includes tools for de simple backgrounds.

Outside of what was inc in this original exchange, A probably won't be pursuing other software deals with N according to Adams. Specifi Appsoft denies it's been cho handle the upcoming new r of NeXTstep.

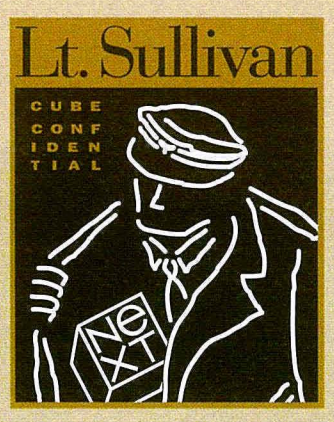
"We'd love to. But we d think we're the right people it," said Adams.

NeXT saves Sullivan's bacon – for now

Thanks to the excitement of *NeXTWORLD* Expo, Sullivan was able to keep his mind off the scorched-earth policy about to hatch back at the Agency. With thousands of his colleagues on the chopping block, he spent Christmas congratulating himself for having developed this little NeXT sidelight. What is ironic is the huge buy of NeXT equipment, software, and peripherals set to roll in from across the Potomac. The cold war may be over, but Sullivan's job is probably safe.

One thing that irked him over the holidays is that encryption algorithm you may have heard about in NeXTstep 3.0. Apparently, NeXT has invented some sort of nonstandard technique and has applied for a patent on it. But the company is unwilling to release any details "for security reasons." The trouble is that there are only about 12 people in the United States capable of inventing a truly secure new encryption system. While NeXT has some astonishingly brilliant engineers, none of them shows up in Agency files as a world-class cryptography expert (those things are tracked carefully).

One key technique of spook craft is the concept of "plausible deniability." With the rancor in the developer community over Appsoft showing no signs of abating, a lot of people figured that NeXT was applying that concept to interface-guru Keith Ohlfs's continued employment at NeXT, even while he worked mainly on his two Appsoft creations, Pixelist and Oscar. Sullivan checked into this one pretty carefully and is convinced there is no truth to the rumor that Keith is headed for Palo Alto. Sometimes the deniability is not only plausible but also actually true.



Did anybody catch the sparks that flew at that big high-tech investor's conference at a San Francisco airport hotel last month? Our boy Steve started it with a dinner speech in which he offered his usual remark about winning the sale "nine of ten times we suit up against Sun." Sun Microsystems chief Scott McNealy returned the fire to the same audience at breakfast. In the world according to Scott, NeXT got only one thing right (its object-oriented OS) and everything else wrong, besides being nonstandard. As for suiting up, McNealy dismissed NeXT's sales as being limited to a tiny market. NeXT lays an egg in Sun's market, he said.

Sullivan guesses that means that the group inside Sun that had been lobbying for NeXTstep on SPARC has been told to cool it. Meanwhile, NeXT is considering going it alone with a SPARC port, especially if a big Wall Street client with a large installed base of Suns will foot the bill.

In other third-party news, portability is the word. Paragon is quietly bringing its state-of-the-art Nisus word-processing package to the NeXT platform. The perennial winner of Macintosh platform awards for best word processor, Nisus should make a huge splash with NeXT users choosing between a lean WriteNow and a quirky WordPerfect. Look for their mathematical typefaces entry in the Software and Peripherals catalog as their first step toward establishing a platform presence.

HyperCube and MediaStation are bonding these days. Features of each program will be showing up in the other in a special working arrangement between the two applications' respective companies. A possible hybrid release is being contemplated, but HyperCube really needs to ship something soon. Alpha 2.1 is looking nice, but I am waiting for my first beta copy.

How do you turn single-user applications into the interpersonal variety? A late-night gathering of four NeXT software developers at a Berkeley ice-cream shop came up with the solution: Hook them up to Adamation's Live Wire, which is due to ship this quarter. Then multiple users on the network can access the same document, though not the same section of the document, simultaneously. The first program to feature the Live Wire hookup is likely to be Glenn Reid's PasteUp.

The coolest thing in Sully's Christmas stocking was the galleys for Adobe's new Purple Book on programming Display PostScript under NeXTstep. Parts of it were tough sledding for the Lieutenant, but this is the sort of thing that lends prestige to the platform. The latest Adobe volume was not a Glenn Reid product he wrote the green one.

Talk about spook craft. There's nothing like an expo to get juicy bits of information. Late nights, dark corners, limited sleep, two glasses of "truth serum," and people loosen up nicely. Remember what you hear and don't forget Lt. Sullivan. Send him a tip and he will send you a token of his appreciation. E-mail me at sullivan@nextworld.com or phone me at 415/978-3374.

If 1991 was
in which N
lished cre
a leader i
software t
and worksta
performanc
is the year
to press its

As it kicks off wh
sider its make-or-br
emphasizing tactica
eral fronts rather t
thrusts. Its hardwar
incremental perfor
a faster CPU and r
board. Its softwa
strengthened with i
tures in NeXTstep
storage options gro
printer and CD-R(

Each new proc
usability of NeXT
strategic move is N
release NeXTste
computers, which
NeXT advantage t
base of users.

The watchwor
better, faster, cheape
the announcement
Turbo systems usi
of-the-line 33M
NeXT is once ag
price/performance
ing customers exac
more for less.

NeXT has also
system product line
were 18 configurat

SIMSON00000862

SIMSON0000863

Appsoft [CONTINUED FROM PAGE
November 20, 1991, can upgra
for free.

Appsoft executives declined
discuss specific features or a sh
date for Oscar, and company
President Randy Adams conce
Appsoft may even decide not t
ship the product. Appsoft does
not have exclusive rights to Os
leaving NeXT open to negotia-
tions with other developers.

Oscar's author, NeXT grap
designer/programmer Keith Oh
said that the version of Oscar u
within NeXT is modeled after
MacroMind Director for the M
intosh. It includes a Script win
for designing individual frames
and a Stage window for playin
back the frames. TIFF or EPS f
can be imported and stored as
mation objects called Cast Me
bers. It includes tools for desig
simple backgrounds.

Outside of what was inclu
in this original exchange, App
probably won't be pursuing a
other software deals with NeX
according to Adams. Specifica
Appsoft denies it's been chose
handle the upcoming new rele
of NeXTstep.

"We'd love to. But we don
think we're the right people to
it," said Adams.

or now

**o cool it. Meanwhile, NeXT is consid-
ecially if a big Wall Street client with
bill.**

**the word. Paragon is quietly bringing
ackage to the NeXT platform. The
ards for best word processor, Nisus
s choosing between a lean WriteNow
athematical typefaces entry in the
ls catalog as their first step toward
presence.**

**diaStation are bonding these days.
am will be showing up in the other in
gement between the two applica-
anies. A possible hybrid release is
t HyperCube really needs to ship
2.1 is looking nice, but I am waiting**

**single-user applications into the
riety? A late-night gathering of four
levelopers at a Berkeley ice-cream
solution: Hook them up to Adama-
is due to ship this quarter. Then mul-
ork can access the same document,
ection of the document, simultane-
n to feature the Live Wire hookup is**

**stocking was the galleys for Adobe's
PostScript under NeXTstep. Parts of
but this is the sort of thing that lends
volume was not a Glenn Reid product;**

*like an expo to get juicy bits of
limited sleep, two glasses of "truth
emember what you hear and don't
he will send you a token of his
xtworld.com or phone me at*

NEW FOR '92

If 1991 was the year in which NeXT established credibility as a leader in system-software technology and workstation price/performance, then 1992 is the year for NeXT to press its advantage.

As it kicks off what some may consider its make-or-break year, NeXT is emphasizing tactical maneuvers on several fronts rather than new strategic thrusts. Its hardware platform gets an incremental performance boost with a faster CPU and redesigned motherboard. Its software foundation is strengthened with important new features in NeXTstep 3.0. Its output and storage options grow with a new color printer and CD-ROM drive.

Each new product enhances the usability of NeXT systems. The one strategic move is NeXT's decision to release NeXTstep on Intel-based computers, which could bring the NeXT advantage to a much broader base of users.

The watchwords for hardware are: better, faster, cheaper—and fewer. With the announcement of NeXTstation Turbo systems using Motorola's top-of-the-line 33MHz 68040 chip, NeXT is once again creating a new price/performance threshold and giving customers exactly what they want: more for less.

NeXT has also vastly simplified its system product line. Where there once were 18 configurations of the NeXTstation there are now only 11, and the NeXTcube is now available in just 7 configurations. The NeXTdimension video card will now be sold only as an add-on product, rather than as a preconfigured system.

NeXT is also delivering its first color printer. Using bubble-jet technology from Canon and the Display PostScript resident on all NeXT machines, the new color printer provides PostScript color output at a dot-matrix price. NeXT's CD-ROM drive establishes a new software distribution medium for NeXT and marks an end to the brief era of the optical drive.

Both peripherals require NeXTstep 3.0, NeXT's operating system upgrade, due this spring. The new version also offers entirely new toolkits for 3-D rendering and database construction, compatibility with non-NeXT networks, and enhanced interface features.

For complete details on each of the new products, see our stories in this special report.

Not included in this report is the product that could have the biggest impact of all: NeXTstep '486. For coverage of this landmark event, see *NeXTWORLD Extra* and The NeXT World in this issue.

What's all this mean? Faster machines for less, color printing for the price of black and white, a new threshold for system-software functionality, and a leap into the world of CD-ROM. By pressing its existing advantage with tactical enhancements in 1992, NeXT rewards its current customers while giving many more users reasons to buy.

—Laurie Flynn & Dan Ruby

What's Inside

NeXTstation Turbo
PAGE 22

NeXT Color Printer
PAGE 26

NeXT CD-ROM Drive
PAGE 29

NeXTstep 3.0
PAGE 31

Joy Ride

♣

NeXT raises the speed limit with its 33MHz '040 NeXTstation Turbos

Price/performance is the yin/yang of workstation computing. You can always cut prices and you can always add more MIPS, but when you do both at once, the impact is multiplied.

In 1990, NeXT scored a stunning improvement in price/performance by selling its monochrome NeXTstation for under $5000 and color systems for less than $8000. Kicking off 1992, NeXT continues its climb up the price/performance curve with the 33MHz NeXTstation Turbo and Turbo Color.

This time around, the improvements are more incremental in both price and performance. While final pricing was not set at press time, NeXT said it expected to reduce the price of existing models by about ten percent. Base Turbo configurations should be priced similarly to today's 25MHz systems. NeXT is also reducing the number of NeXTstation configurations it will offer – from 18 systems to only 11.

NeXT has boosted performance by increasing the clock speed of the '040 processor by 25 percent. The new computers also have a redesigned memory subsystem that dramatically improves the performance of certain kinds of tasks – sometimes by as much as 66 percent, when compared with the 25MHz monochrome NeXTstation. The current NeXTstation Color already employs memory interleaving, so the performance gain for the Turbo Color is not as dramatic. Also, a redesigned Peripheral Controller (PC) chip further improves system performance by speeding

by Simson L. Garfinkel

up the SCSI bus while preventing input/output operations from interfering with each other and slowing down the system. For example, the new machines don't slow down as much when the internal floppy disk is in use.

"Our main goal in coming up with the [Turbo] was to 'raise the bar' – improve the performance and keep the price point similar or better, depending on which version you are buying," says Ken Jochims, NeXT's CPU product manager.

Evolution of the species

In *NeXTWORLD*'s tests, we found that the new monochrome 33MHz system loads and recalculates an Improv worksheet in two-thirds the time a 25MHz system would need.

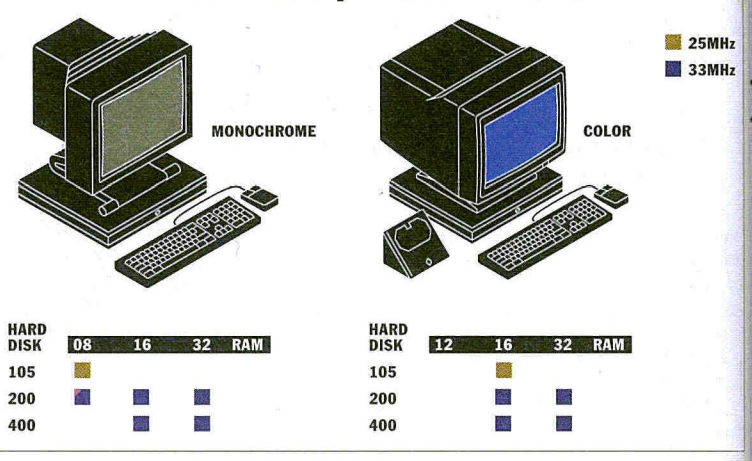
address out of one bank, the subsystem simultaneously asks the other bank to prefetch the subsequent memory location. If the CPU then tries to read that memory location (and reading sequential memory locations is something that the CPU frequently does), the data becomes instantly available.

At the heart of the new memory system is a new custom ASIC (Application-Specific Integrated Circuit) called TMC. (The chip's initials stand for Turbo Memory Controller.) The chip controls the NeXT's DRAM, internal ROM, and video RAM (VRAM).

The TMC chip has three memory interfaces: a 32-bit, a 16-bit, and an 8-bit.

The 32-bit interface is for the

The New Lineup of NeXTstations

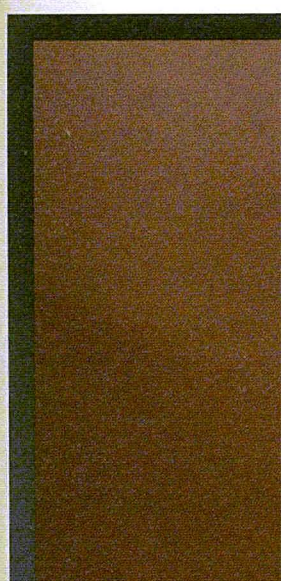


WriteNow scrolls 60 percent faster. It's even faster to log in – 7 seconds, compared with 10 seconds on last year's model. The Turbo Color was 30 percent better on CPU-bound tasks, less on other jobs that involve writing to the screen or accessing the disk.

In addition to the faster CPU, monochrome users will see the biggest improvement because of memory interleaving. With interleaving, the NeXT's memory bank is split into two halves: an "even" and an "odd" bank. When the 68040 CPU asks the memory subsystem to read a memory

system's main memory. On a color system, this interface also connects with the system's VRAM. The 16-bit interface is used exclusively on monochrome systems as a private VRAM interface. Having two memory buses means improved throughput for the monochrome system, since most screen updates are accomplished by having the '040 reading from main memory and writing to VRAM. That means improved performance on scrolling and graphics operations.

The 8-bit interface plays two roles. When the NeXT boots, the eight data lines are used to transfer



Use a 33MH
perform

PHOTOGRAPHS BY BILL P

SIMSON00000864

SIMSON0000086S

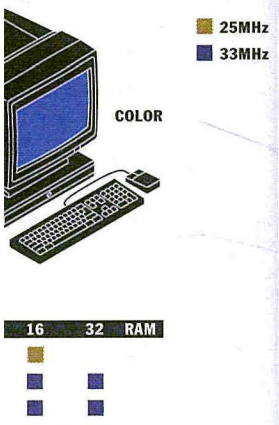
t of one bank, the sub-
ıultaneously asks the other
efetch the subsequent mem-
ın. If the CPU then tries to
nemory location (and read-
tial memory locations is
that the CPU frequently
data becomes instantly

e heart of the new memory
ı new custom ASIC (Appli-
cific Integrated Circuit)
IC. (The chip's initials stand
Memory Controller.) The
ols the NeXT's DRAM,
OM, and video RAM

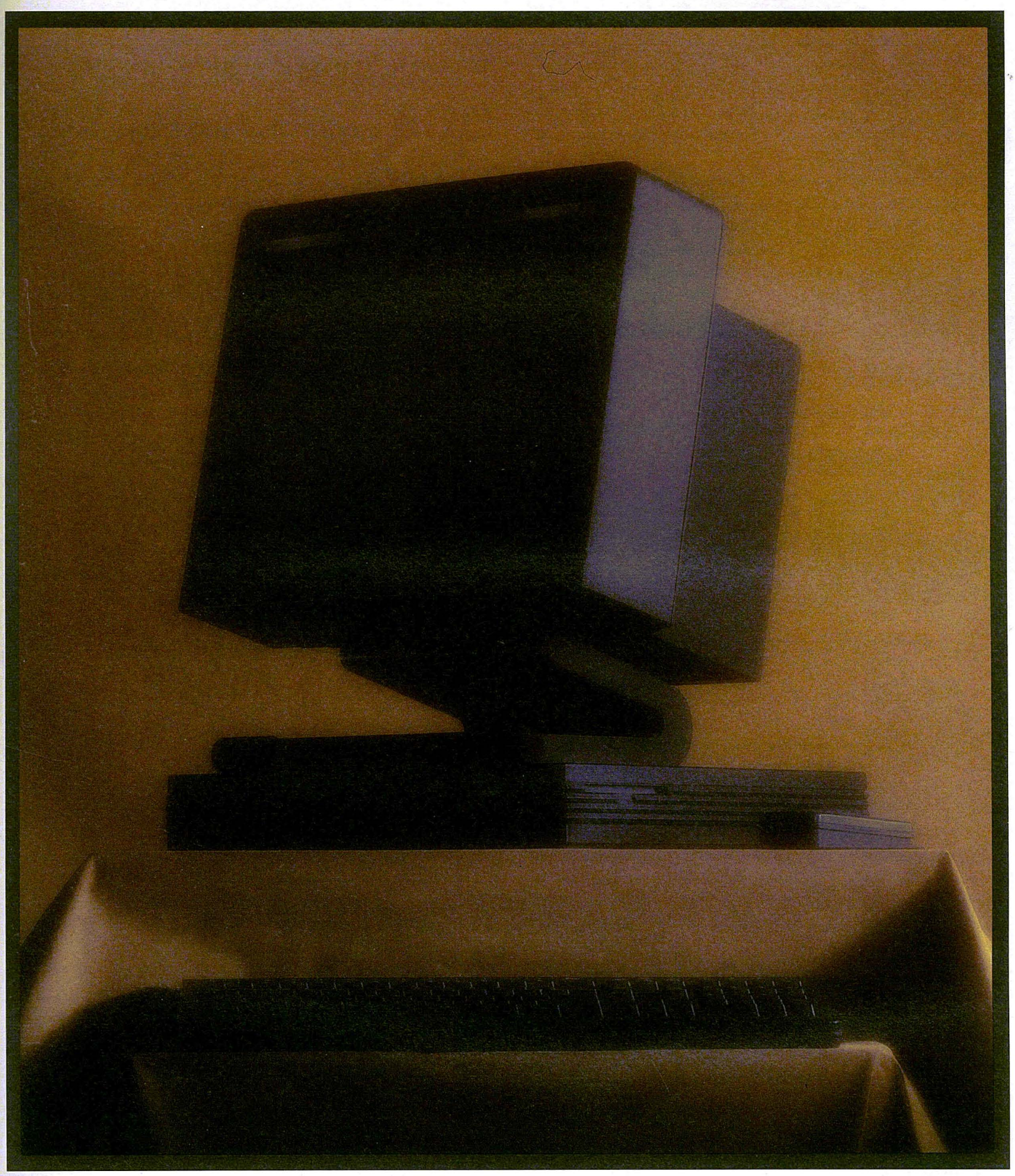
TMC chip has three mem-
ıces: a 32-bit, a 16-bit, and

32-bit interface is for the

Tstations



ıain memory. On a color
ıs interface also connects
ystem's VRAM. The 16-bit
s used exclusively on mono-
stems as a private VRAM
Having two memory buses
proved throughput for the
ome system, since most
dates are accomplished by
e '040 reading from main
ınd writing to VRAM. That
proved performance on
and graphics operations.
8-bit interface plays two
ıen the NeXT boots, the
ı lines are used to transfer



NeXTstation Turbo and NeXTstation Turbo Color

Use a 33MHz version of the 68040 chip to deliver faster performance for about ten percent less than the cost of the NeXT's 25MHz systems. In our tests, the machines performed 66 percent faster than some 25MHz NeXTstations, with a new memory scheme causing the monochrome systems to show the greatest improvement.

PHOTOGRAPHS BY BILL PAG

data out of the system's ROM. When the ROM is not in use, the eight lines are split into two groups of four lines each and are used to transfer the parity bits from the SIMM banks into the memory controller. Because the parity bits are transferred over their own data lines and parity checking is done in parallel, there is no performance penalty for using parity memory on the new systems.

Another performance enhancement of the new TMC chip is its so-called "5-1-1-1" access timing. The "5" means that the NeXT's '040 CPU can read any 32-bit memory location in five clock cycles. The "1-1-1" means that, after the CPU reads that first location, it can read the following three sequential 32-bit words in just one clock cycle each. This meshes neatly with the 68040's burst-mode data transfer, where the CPU requests four sequential 32-bit locations, one right after the other, from system memory. On the new Turbo system boards, it only takes eight clock cycles to transfer 16 bytes from main memory to the CPU.

If the CPU goes and reads a fifth successive 32-bit word, it's available in just three clock cycles, instead of five. That's because the memory system anticipates the fifth memory read and prefetches the data at that location. "Conceptually, this is a 64-bit memory system," says Tim Bucher, the Turbo project's technical team leader.

Carry big sticks

NeXTstation Turbo Color users won't see as big a performance improvement from the memory subsystem for two reasons: the old NeXTstation Color already used interleaved memory, and the color systems don't have a private bus for the video memory. "There were so many bits to move around, it was impractical to give it its own bus," says Kevin Grundy, NeXT's director of workstation development.

The memory chips for all NeXTstation Turbos are standard 72-pin, 32-bit SIMM packages. The good news for memory hogs is that the new system boards will hold up to 128MB of RAM. The bad news is that the new boards have only four SIMM slots, which means that the only way to get 128MB into a system is by using 32MB sticks (a 72-pin circuit board with 16-megabit chips mounted on both sides).

Ideally, you should use SIMM memory with a 70ns access time with the new systems. But don't worry if you already have memory with 80ns or 100ns access time: with most slower SIMMs, the Turbos will automatically realize that you've put in slow memory and reconfigure themselves appropriately.

A new peripheral chip

Both Turbo workstations feature NeXT's redesigned PC ASIC, which handles data transfer to and from the Ethernet network, sound system, laser printer, SCSI bus, floppy disk, and DSP (digital signal processor). Like the old PC chip, the new chip allows for simultaneous data transfers between any of these devices and the NeXT's main memory. But the new PC chip is faster. "You can have the channels transferring stuff simultaneously without running out of bandwidth or running into any latency problems. That was our design goal," says Danesh Tavana, head of NeXT's PC chip development team.

NeXT has also reworked the NeXTstation's DMA (direct memory access) channel. Together with the improved PC chip, this means that the NeXTstation's NCR 53C90A SCSI chip can be clocked at a faster speed, which makes for faster SCSI bus transfers. This should help make applications launch faster on the new system. It should also help make paging faster on those memory-crippled 8MB systems.

Upgrading

Current NeXT owners can upgrade to the Turbo with a motherboard swap. Monochrome NeXTstations will also need a complete memory transplant, though NeXTstation Color systems will not. Upgrade pricing and availability was not known at press time.

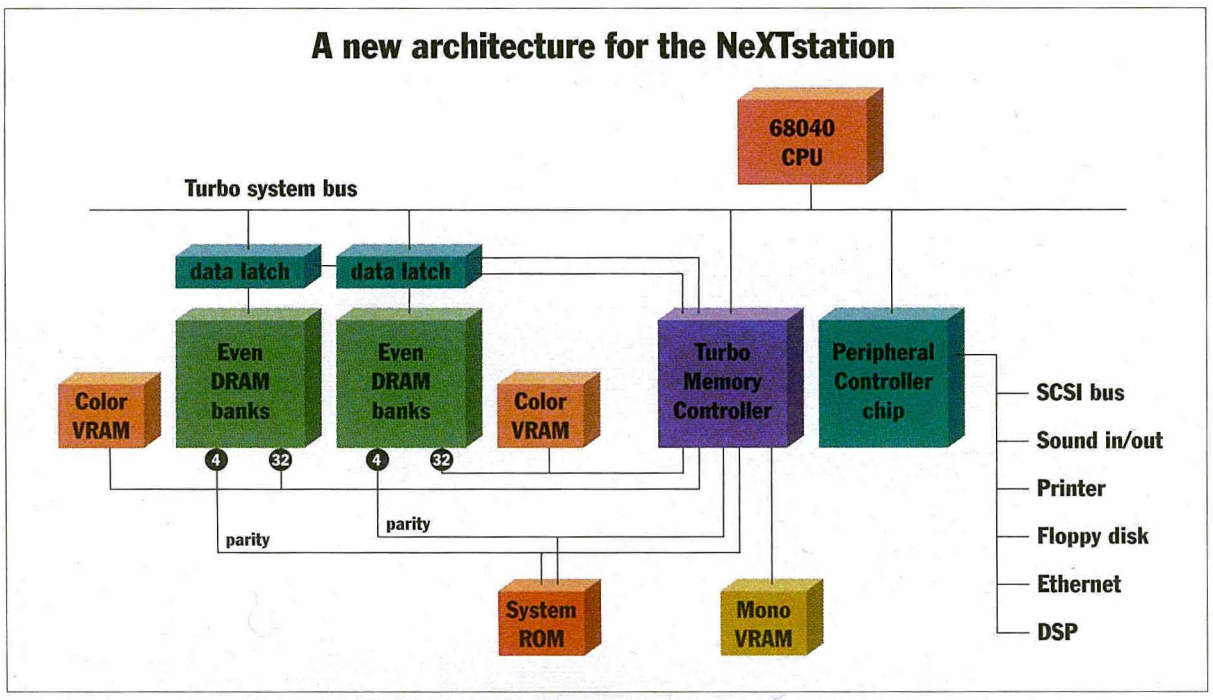
NeXTstep Version 2.1 won't work on the 33MHz motherboard. The problem has to do with the barebones hardware of the new TMC and PC chips: The new chips are different enough to require their own special form of initialization. For most users this should be no problem, since the new NeXTstation Turbos will come with Version 2.2 (and soon, NeXTstep Version 3.0) installed on their hard disks. But if you have a portable hard disk that you like to boot from, you'll have to use BuildDisk and create a 2.2 version for yourself.

The NeXTstation Turbos will also have a ROM upgrade that will allow them to boot NeXTstep off an attached CD-ROM drive.

Other than the new initialization code, however, NeXTstation Version 2.2 has absolutely no new features or bug fixes. NeXT will therefore not be providing an upgrade application to turn a 2.1 system into a 2.2 system.

So what's the bottom line? "It's not like going from the '030 to the '040, where there was a world of difference," says Jochims. On the other hand, if somebody switches your 25MHz machine for a 33MHz machine without telling you, you'll be pleasantly surprised.

SIMSON L. GARFINKEL *is a senior editor at* NeXTWORLD.



The Turbo systems feature a redesigned motherboard equipped with a faster peripheral chip and the new, custom Turbo Memory Controller.

Statio NeX benchn line o

NeXTWORLD's benc erally confirmed wha computers. NeXT's c tle faster than its mor tasks (like Improv r memory architecture, tasks (like scrolling a because the NeXTstat on the screen, as oppc per pixel.

On the new NeXT Both color and monc advantage of interleav the machines on C monochrome machine' availability of the 32- tions that do not invol is also faster than the again, owing to the fa of memory to paint ar

The only big surp dimension (ND). Our graphics processor wa came when we ran th this test just as quickly station, which led us to actually running the Di CPU and was simply of rectangles and imag to NeXT confirmed th not on the i860.

The second surpri slow the computer's d ing about 32 bits of int prising that the monoc to a Macintosh in 24- simply hoped for perf

SIMSON00000866

SIMSON0000867

clocked at a faster speed,
s for faster SCSI bus
iis should help make appli-
ch faster on the new sys-
ld also help make paging
ose memory-crippled
is.

ling

XT owners can upgrade to
vith a motherboard swap.
ne NeXTstations will also
plete memory transplant,
XTstation Color systems
grade pricing and availabil-
known at press time.
'step Version 2.1 won't
33MHz motherboard.
n has to do with the bare-
vare of the new TMC and
The new chips are different
equire their own special
ialization. For most users
be no problem, since the
station Turbos will come
n 2.2 (and soon, NeXT-
n 3.0) installed on their
But if you have a portable
nat you like to boot from,
to use BuildDisk and create
n for yourself.
NeXTstation Turbos will
ROM upgrade that will
to boot NeXTstep off an
D-ROM drive.
than the new initialization
ver, NeXTstation Version
olutely no new features or
NeXT will therefore not be
n upgrade application to
system into a 2.2 system.
nat's the bottom line?
ce going from the '030 to
here there was a world
ce," says Jochims. On the
, if somebody switches
Hz machine for a 33MHz
ithout telling you, you'll
ly surprised.

N L. GARFINKEL *is a*
at NeXTWORLD.

Station-to-station: NeXTWORLD benchmarks the full line of NeXT CPUs

NeXTWORLD's benchmarks revealed a few surprises but generally confirmed what we had expected about NeXT's line of computers. NeXT's old 25MHz NeXTstation Color was a little faster than its monochrome partner on purely CPU-bound tasks (like Improv recalculations) thanks to its interleaved memory architecture, but significantly slower on display-bound tasks (like scrolling and displaying rectangles on the screen) because the NeXTstation Color has to set 16 bits for every pixel on the screen, as opposed to the monochrome machine's 2 bits per pixel.

On the new NeXTstation Turbos, things are a little reversed. Both color and monochrome machines have the performance advantage of interleaved memory. The small difference between the machines on CPU-bound tasks has to do with the monochrome machine's private video bus, which slightly improves availability of the 32-bit DRAM memory channel for operations that do not involve the screen. The monochrome machine is also faster than the color machine on screen operations – again, owing to the fact that it has to set eight times fewer bits of memory to paint anything on the screen.

The only big surprise was the performance of the NeXTdimension (ND). Our first hint that the NeXTdimension's i860 graphics processor wasn't actually running Display PostScript came when we ran the font-setting benchmark: The ND ran this test just as quickly (or slowly) as the monochrome NeXTstation, which led us to conclude that the NeXTdimension was actually running the Display PostScript interperter on the 68040 CPU and was simply using the i860 to do the actual drawing of rectangles and images on the color screen. A telephone call to NeXT confirmed this: Display PostScript runs on the 68040, not on the i860.

The second surprise with the ND was discovering just how slow the computer's display actually is. Sure, the i860 is moving about 32 bits of information per pixel; perhaps it is not surprising that the monochrome NeXTstation is faster. Compared to a Macintosh in 24-bit color, the ND truly blazes. We had simply hoped for performance that was a little zippier.

-Simson L. Garfinkel

All benchmarks have been normalized, so that a score of 1.0 represents a 16MB 68040 monochrome system. Higher numbers indicate improved performance and reduced time to complete the indicated benchmark.

WriteNow Scrolling

For our WriteNow benchmark, we constructed a 985-page, 255,308-word document, consisting of several pages from NeXT technical reference manuals, a variety of UNIX pages, Shakespeare's *Hamlet*, and the first five books of The Bible. We tested how fast WriteNow could start up, load the document, jump to the end of the document, and scroll, one page at a time, from the beginning to the end of the document.

Improv Recalc

To test speed with Improv, we constructed a massive Improv model consisting of two worksheets and one graph. The first worksheet held the model's initial and final values, as well as constants used in the calculations. The second worksheet had three dimensions with 500 rows, each with a starting value, three values based on multiplications and additions, and an average value. The entire system of rows and averages was then repeated in a second dimension, for a total of 3000 multiplications, 13,000 additions, and 1010 divisions.

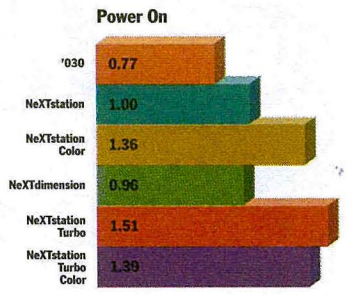
Times that we measured include the time that it took Improv to load the model, time to finish the initial recalculation, and time for a change to the initial value to propagate through the entire system.

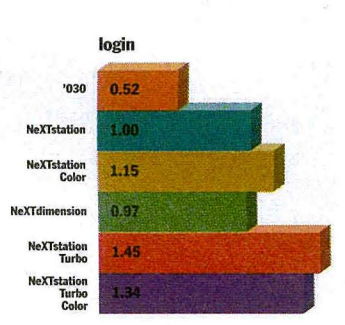
Rectangle

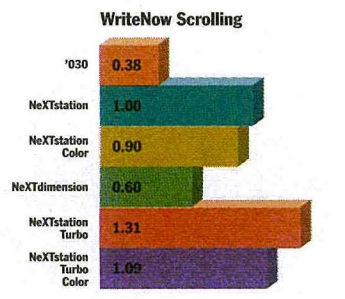
This benchmark tested how fast the computer's Display PostScript interpreter could write pixels on the screen. The benchmark downloaded a small PostScript function that painted a 15-by-15-square checkerboard on the screen, with each square 25 pixels on a side. The function painted the squares with alternating colors using 2, 4, 16, and 256 shades of gray. (On systems with less than 8 bits of color, Display PostScript automatically halftones the rectangles to simulate the requested shade.)

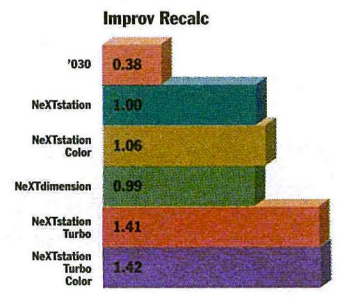
Font Set

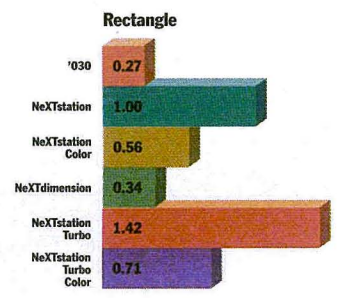
This benchmark tested how fast the computer's Display PostScript interpreter could rasterize a font. The benchmark displayed a sample peice of text on the screen in Times Roman, using font sizes from 999 point down to 5 point. The speed at which the computer can rasterize a font affects the response time when the user requests a font family and size combination that hasn't been used recently. It can also affect printing speed.

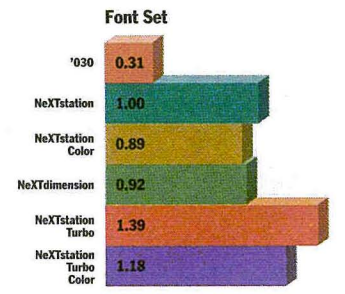












Color For Everyone

♣

With Canon's inkjet technology and NeXT's built-in PostScript, the NeXT Color Printer provides a breakthrough in low-cost, quality color

The NeXT Color Printer (NCP), due out with NeXTstep 3.0 this spring, is one of those computer peripherals – like the original Apple LaserWriter – that may provide a reason in itself to buy a computer. While the internals of the device – Canon's BubbleJet color printer engine – are not unique, its marriage to the NeXT system and built-in Display PostScript add up to a breakthrough: It is the first PostScript color printer priced at under $3500.

That's inexpensive enough to move high-resolution color output out of the big production house and onto the office desktop. By making quality color printing widely available to individual users and departments, the NCP offers a compelling new capability that will sell NeXT computers.

Like the NeXT Laser Printer, the NCP depends on the NeXT to process the PostScript code, making it possible to get PostScript color out of what is otherwise, in this case, a dot-matrix printer. The unique host relationship that the NeXT has to its printers makes upgrades in the workstation's image-processing ability immediately available to the printer. Because NeXTstep 3.0 will support Pantone color matching and PostScript Level 2 (see "Another Step Ahead" in this issue), the NCP automatically has those features.

by **Darcy DiNucci and Dan Lavin**

The Canon print engine contributes its own key features: top color quality, impressive speed, and easy maintenance. Canon's new inkjet-on-demand technology works with the same CMYK (cyan, magenta, yellow, black) color model used by professional printers. The results are stunning colors that more closely resemble professionally printed output than do colors produced by the thermal wax RGB technology used by most desktop PostScript printers. And it can print on plain paper, making in-house print runs for personalized letterhead or custom marketing materials a snap.

Inkjet on demand

The NCP weighs 22 pounds and measures 20.5 inches wide by 16 inches deep by 6.7 inches high. It has a single paper tray, designed to hold any size paper, up to 11 by 17 inches. It also prints envelopes.

Canon's inkjet-on-demand technology uses four print heads, one each for cyan, magenta, yellow, and black, fed by replaceable ink cartridges. Each print head has 64 nozzles spraying ink at the page at 360 dpi. When a drop of ink is required, the NCP heats a holding cell, creating an air bubble that forces a precise amount of ink out the nozzle. All four colors are laid down in one pass across the page, rather than the one-pass-per-color scheme used by most thermal wax printers, for faster printing and sharp color registration.

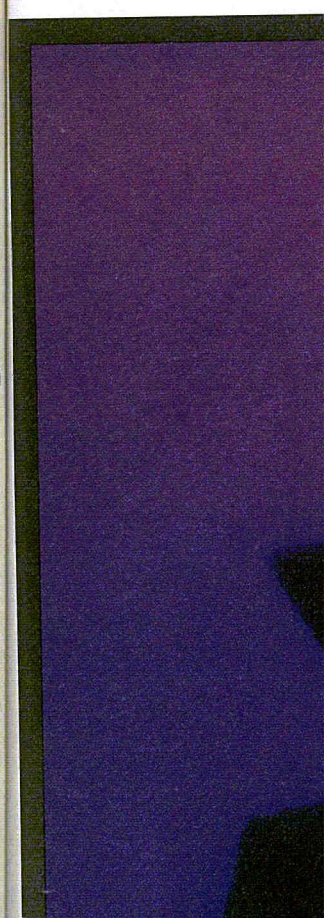
NeXT doesn't specify a number of colors the technology can produce; the dithering algorithm depends on the blending of the different colors of wet ink, within a single dot and between adjacent dots. The alcohol-based inks are dry before the paper leaves the printer, and since the inks are not water soluble, they won't bleed if the paper gets wet after printing.

The inkjet colors have a matte finish, less bright than that produced by the thermal wax technology, the current market standard. In addition, the CMYK colors from the NCP are earthier than RGB output. The pages are smooth to the touch, minus the waxiness common with other technologies. As with most halftoning techniques (based on individual dots of color, rather than continuous tones), the output from the alpha version we were able to test (shown here) was somewhat grainy (NeXT reported that it was still working on its halftoning algorithm).

"On-demand" means that the printer uses only the ink needed for the image at hand, also a departure from thermal wax technology, which allocates an entire color sheet to each page, whether the image requires one dot or a full page of that hue. This contributes to the low cost of the prints. For a page with average coverage, the ink cost is just 12 cents, compared to about 50 cents per sheet for thermal wax. The on-demand technology also enables the NCP to print black-only pages for just pennies a page. You could, therefore, theoretically get by with just one printer. (Printing black-and-white pages from the NCP would be significantly slower than on the laser printer, however, since data must still be processed for all four colors.)

Also unlike thermal wax, the NCP uses standard paper. The quality of the print varies widely with the quality of the paper. Copy paper, like that used in a laser printer, results in muted colors; typing bond gives a better result; and for finest quality, Canon recommends its own coated stock (though any inkjet bond would probably work fine). Transparencies also require special inkjet stock. The transparency film, coated paper, and replacement ink cartridges are all available from NeXTConnection and other dealers.

The NCP benefits from Canon's long experience with high-end copiers and attendant service contracts –

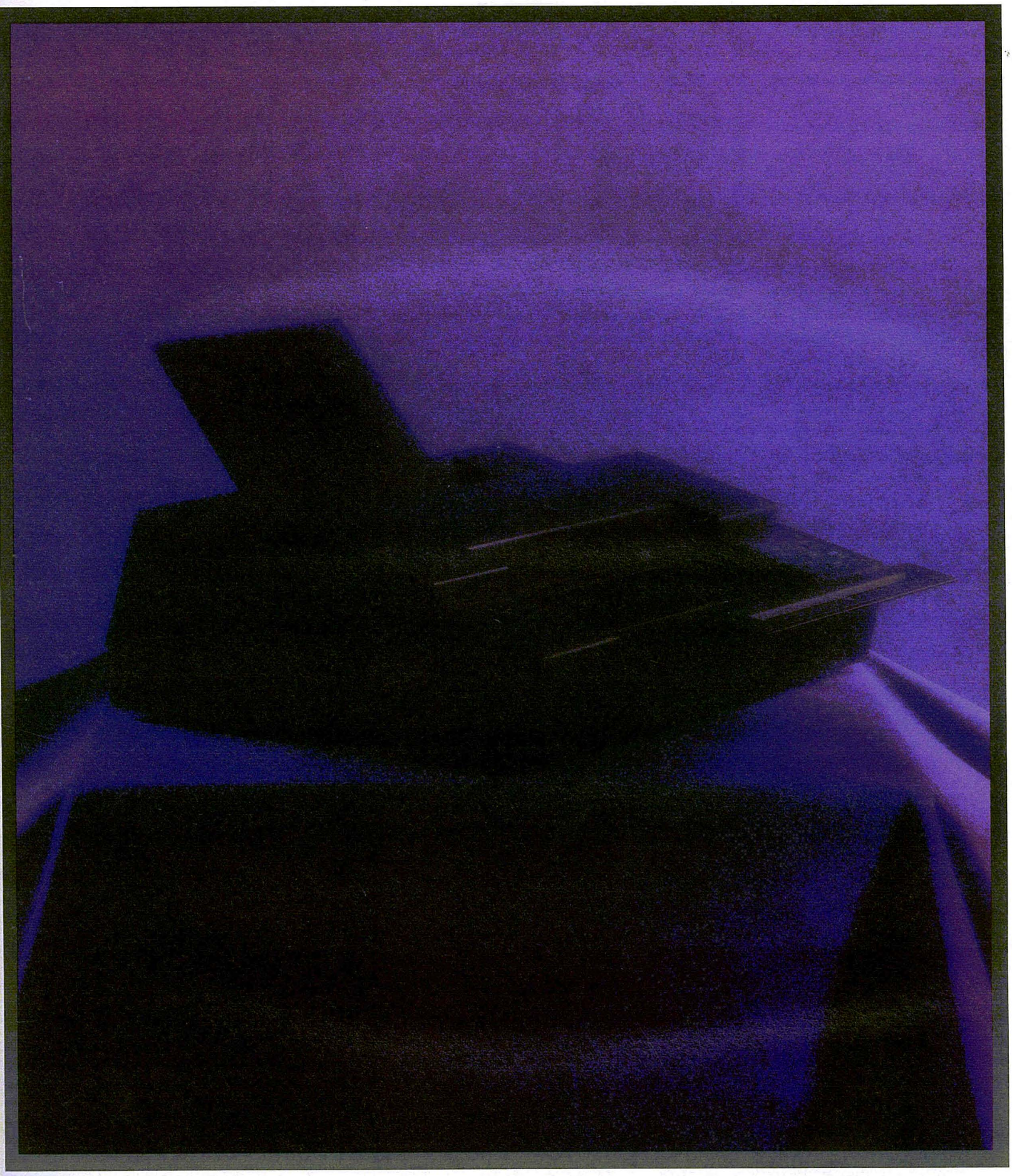


Plain-p

SIMSON00000868

69800000NOSWIS

:mal wax technology, the
ırket standard. In addition,
ζ colors from the NCP are
an RGB output. The pages
ı to the touch, minus the
ommon with other tech-
As with most halftoning
ȝ (based on individual dots
ather than continuous
ː output from the alpha ver-
ere able to test (shown here)
what grainy (NeXT
hat it was still working on
ıing algorithm).
-demand" means that the
es only the ink needed for
at hand, also a departure
mal wax technology, which
ın entire color sheet to each
ther the image requires one
ull page of that hue. This
es to the low cost of the
ır a page with average cover-
ık cost is just 12 cents,
l to about 50 cents per sheet
ıal wax. The on-demand
gy also enables the NCP to
ck-only pages for just pennies
ou could, therefore, theoreti-
by with just one printer.
; black-and-white pages from
' would be significantly
ıan on the laser printer, how-
ːe data must still be processed
ur colors.)
ɔ unlike thermal wax, the
ːs standard paper. The quality
int varies widely with the
ıf the paper. Copy paper, like
l in a laser printer, results
l colors; typing bond gives a
sult; and for finest quality,
ecommends its own coated
ıough any inkjet bond would
ɣ work fine). Transparencies
uire special inkjet stock.
ısparency film, coated paper,
acement ink cartridges are
ıble from NeXTConnection
er dealers.
ıe NCP benefits from Canon's
ɔerience with high-end copiers
ndant service contracts –



NeXT Color Printer

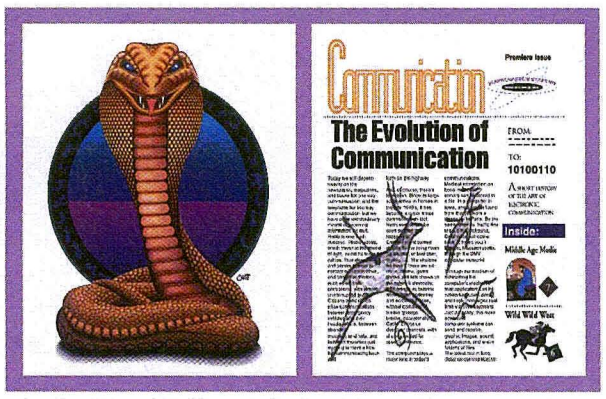
Plain-paper, CMYK color, based on the Canon BubbleJet print engine. Prints at approximately 2.5 minutes/page (fine mode), 1 minute/page (draft mode).
Price: $3495

maintenance demands are kept to a minimum. The cartridges are easily replaceable and each color is a unique shape, so it fits only into its proper slot. The print heads are modular, so they can be replaced, if required, with little trouble.

RIPing speed

Because NeXT puts the PostScript RIP (Raster Image Processor) in the workstation CPU rather than sending raw PostScript to the printer, the computer has to send the printer a lot of data: about 5.5MB per page (compared to about 1.5MB for a black-and-white page on the laser printer).

The NeXT Laser Printer attaches to the NeXT's printer port, which transfers data at 5-megabits per second. To support greater throughput, the NCP attaches to the NeXT's SCSI port, which can transfer data at 4MB per second (depending on what else the computer is doing at the time). In contrast, other PostScript printers must attach to the NeXT through the serial port, which transfers data at a mere 19.2KB per second – essentially a slow crawl. (For more on the ins and outs of printing with non-NeXT printers, see "Color In, Color Out," *NeXTWORLD* Fall 1991.) The processing and transfer speeds result in a throughput of about 2.5 minutes per page (1 minute for draft mode) for a full PostScript page. Of course, printing speed depends on the amount of memory in your NeXT workstation and the amount of other work the machine is doing at the time.



The NeXT Color Printer produces quality output with a matte finish.

The use of different ports for each NeXT printer means that you can have both a laser printer and the color printer attached to a single workstation, both printing at the same time. Like the laser printer, a color printer attached to the SCSI port will be available to other computers over an Ethernet network.

Anyone whose computer is host to a NeXT Laser Printer has noticed that burdening the workstation with the RIPing of PostScript images is a mixed blessing. The NeXT's multitasking system puts printing in the background, but it maintains a high priority, and other work at the computer slows to a crawl while a graphic is being printed. That's because the data being fed to the printer must keep up with the inexorable roll of the laser printer's drum. In the color printer, the drum needs just one line of data at a time, then waits for the next line before it rolls. Pressure is off the workstation processor.

No red Ink

There's nothing like the NCP on any other platform, nor is there bound to be until another manufacturer adopts Display PostScript. It's the only PostScript color printer available for under $4000, and the only CMYK PostScript printer you can touch for under $8000. For desktop publishers and graphic artists, it may be a compelling reason to move their work onto the NeXT platform.

DARCY DINUCCI *is managing editor and* DAN LAVIN *is a senior editor at* NeXTWORLD.

Go OD, CD-

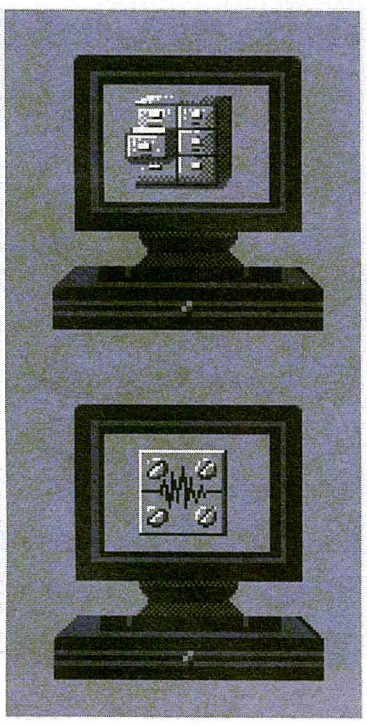
NeXT adopts standard d

NeXT is phasing disk and leading adopting CD-RO software distribut these CD-ROMs, CD-ROM drive. Starting with 1

by Dan Lavin



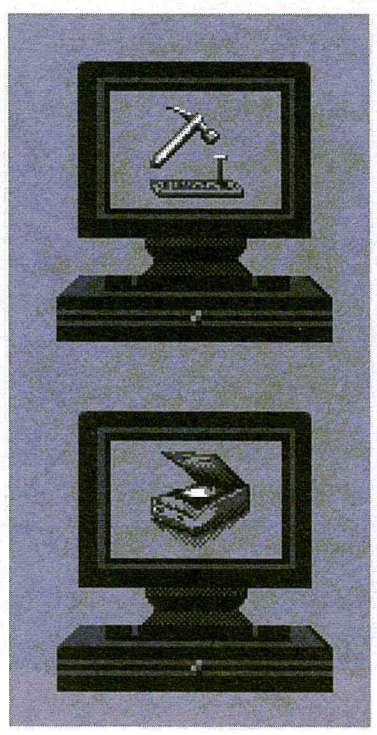
PaperSight® is the NeXT™ step to the paperless office.



With Visus' PaperSight®, you can scan in your paper documents, file them, then quickly retrieve them, review them, and annotate them with text or voice notes. You can use your scanner as a copier. Or use Xerox Information System's Optical Character Recognition and HSD's OCR servant to convert scanned documents for use with other applications, including word processors and spreadsheets. All NeXT capabilities are available with PaperSight, including speaker/listener communications, and fax input and output.

At Visus, we have the largest selection of scanners available. We also have Pittsburgh Project Manager to help you plan your projects. We have the Sphinx SpeechKit for adding Speaker Independent Voice Recognition to your applications. For more information, on PaperSight and Visus scanners and other products, call **412-488-3600**, FAX 412-488-3611, or write Visual Understanding Systems, Inc., 2100 Wharton Street, Suite 701, Pittsburgh, PA 15203.
From the people who put the FaxDaemon™ on every NeXT machine.

VISUS™



PaperSight and Visus are trademarks of Visual Understanding Systems, Inc. All other product names are trademarks of their respective manufacturer.

Circle 5 on reader service card

SIMSON00000870

SIMSON0000087 1

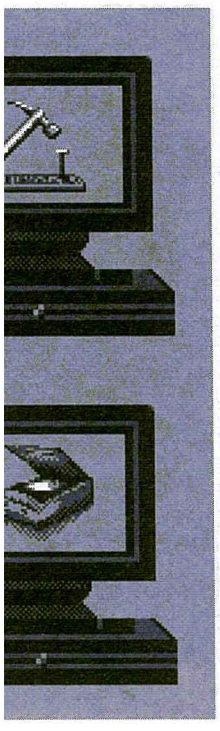
ed to the printer must keep
inexorable roll of the laser
ım. In the color printer, the
just one line of data at a
vaits for the next line before
sure is off the workstation

Ink

hing like the NCP on any
rm, nor is there bound to
other manufacturer adopts
stScript. It's the only
color printer available for
00, and the only CMYK
printer you can touch for
00. For desktop publishers
artists, it may be a com-
on to move their work onto
platform.

DiNUCCI *is managing*
AN LAVIN *is a senior*
XTWORLD.

office.



Goodbye OD, Hello CD-ROM

♣

NeXT adopts read-only discs as its standard distribution medium

NeXT is phasing out its one-of-a-kind optical disk and leading the computer industry in adopting CD-ROM as its standard medium for software distribution. To let its customers read these CD-ROMs, NeXT will be selling a new CD-ROM drive.

Starting with release 3.0, NeXT will cease distributing NeXTstep on the original Cube's magneto-optical disk. Instead, NeXT will only distribute the operating system preinstalled on a hard disk, or on CD-ROM. Current NeXT users will need to purchase or borrow a CD-ROM drive in order to upgrade their existing systems. But in so doing, users will have a whole new world of information open before them.

by **Dan Lavin and Simson L. Garfinkel**

What is CD-ROM?

The audio compact disc that has become the mainstay of the music industry is really a software distribution system. Music is digitized by a computer into a stream of ones and zeros and burned into a metallic master disk that is used to produce the compact discs sold in stores. Inside the compact disc player, another computer reads back the information, applies a series of error correction processes, sends the music through a digital-to-analog converter, and produces the original sounds. (For more on digital-to-analog conversion, music, and the NeXT, see "The Music Box," *NeXTWORLD* Winter 1991.)

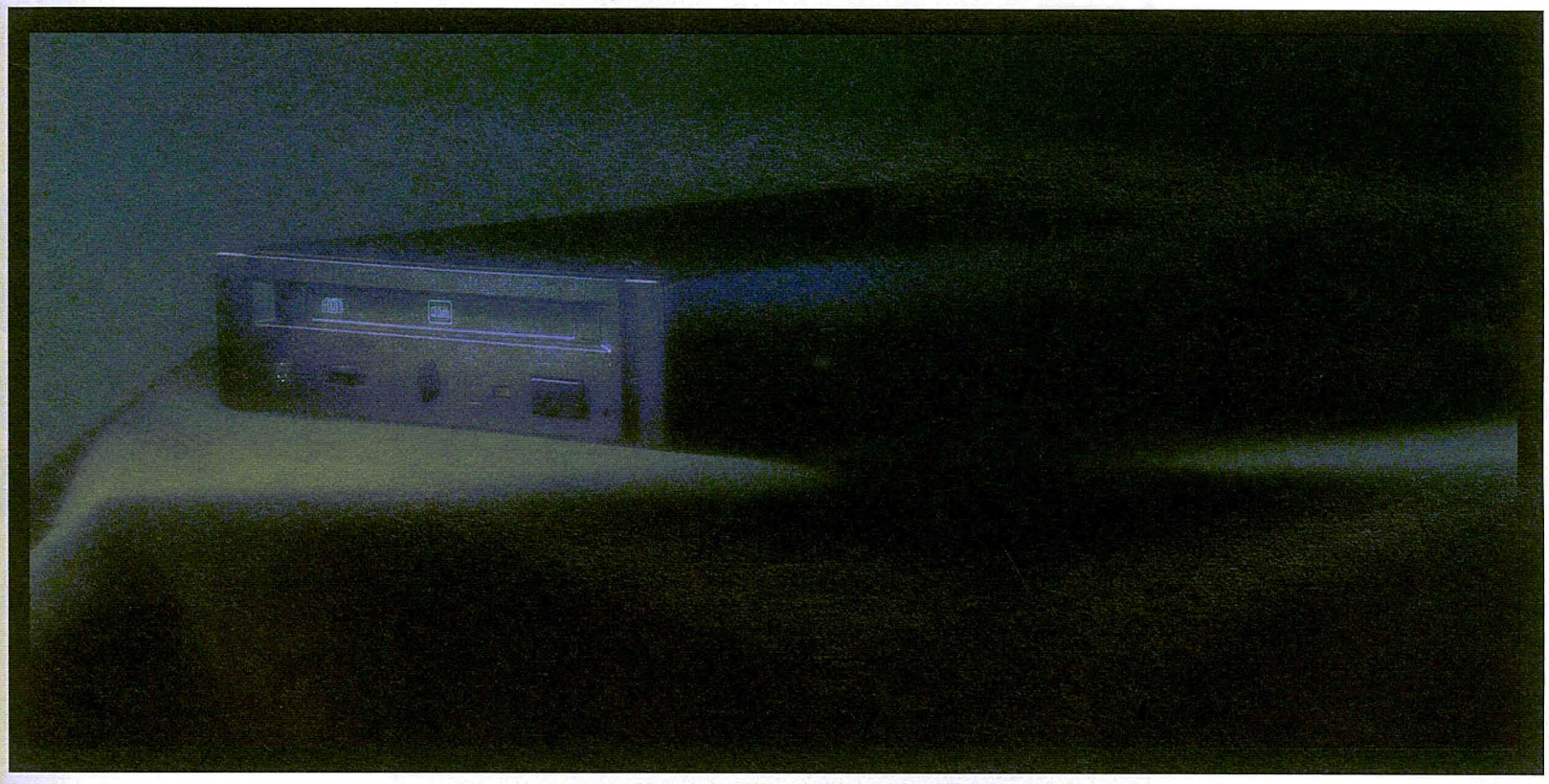
CD-ROM works the same way, except there's no music. Instead, CD-ROM uses an additional layer of error-correcting codes to make the data stored on the disc even more reliable.

The big advantages of CD-ROM are data capacity and cost: A single CD-ROM stores 660MB of information – more than twice the original NeXT optical disk – and costs less than a dollar to produce. CD-ROMs can also be manufactured very quickly.

Like audio compact discs, the information stored on a CD-ROM cannot be changed. This makes CD-ROM an ideal distribution mechanism for computer software; users are guaranteed that the data on their CD-ROMs is exactly the information that the publisher put there. There's no chance that a disk could get accidentally corrupted, or have a virus or Trojan Horse inserted in the software.

Hardware

NeXT's $795 CD-ROM drive contains the Sony ST541 CD-ROM



NeXT CD-ROM Drive

Contains the Sony ST541 CD-ROM mechanism. Attaches to the NeXT through the SCSI interface.
Price: $795

mechanism – similar to the one used by Apple. CD-ROM players attach to the NeXT through the SCSI interface, just like an external hard disk drive.

The drive has burst transfer rates up to 1.5MB/sec and an average transfer rate of 150KB/sec (owing to the CD-ROM's slow rotation speed). The drive features a large 64KB cache. It is 12⅞" long, 7" wide, and 1¾" tall, and weighs almost 7 pounds. It is painted black and has the familiar NeXT logo on the front.

The drive comes with a CD-ROM containing NeXT information and a collection of demo programs. It can read both CD-ROMs and traditional audio compact discs. Unfortunately, due to a patent-licensing restriction, the digital information stored on an audio disc can't be read directly into the computer through the SCSI port. Instead, there are two RCA-style jacks on the back of the CD-ROM drive for connecting an external amplifier. (The NeXT CD-ROM drive also has a headphone-style jack on the front with a small volume control.)

Software

The data on CD-ROMs comes in two main formats: Macintosh Hierarchical File System (HFS) or International Standards Organization's (ISO) 9660 CD-ROM format.

NeXTstep has been able to read ISO 9660 CD-ROMs since Version 2.0 of the operating system. With Version 3.0, NeXTstep has been modified to work with the so-called Rock Ridge Extensions, which allow for long file names and full UNIX file permissions. Viewing the contents of a CD-ROM is as easy as putting the disc into the drive and having an icon appear in the Workspace Manager.

Although there are few NeXT-specific CD-ROMs on the market, being able to read ISO 9660-formatted discs allows NeXT users to access a growing number of discs containing clip art, fonts, and databases. "It opens up 50 percent of the CD-ROM best-sellers to NeXT users," says Barry Cinnamon, president of the Bureau of Electronic Publishing in Upper Montclair, New Jersey, a company that both sells CD-ROMs and publishes its own.

Data stored on CD-ROMs can even be indexed with Digital Librarian – albeit with some difficulty. The problem is that Digital Librarian normally records the index files in the same directory in which the data being indexed is located. But most CD-ROMs aren't indexed for the NeXT. Since the CD-ROM is read-only, there's no way to put the information there once the disc is stamped.

"What we really want is for people to put the indexes on CD-ROM," says Adam Hertz, who heads NeXT's information architecture group. "If the publisher doesn't do that, they're making life more difficult for the user." Digital Librarian 3.0 will probably be modified to deal with this problem, says Hertz.

Many CD-ROMs designed for use with IBM PCs have their data stored in proprietary index formats. The only way to access the information stored on them is by using a PC data retrieval engine. For that reason, NeXT is working with Insignia Solutions to improve SoftPC's handling of the CD-ROM drive.

While CD-ROMs mastered in the Macintosh HFS format are likely to remain troublesome for NeXT users for some time to come, Barry Cinnamon sees them less of a factor in the future. "I think that everybody's moving to ISO 9660," he says. Disks formatted in HFS can't be read on IBM PCs either.

Additional software under development by NeXT should allow the drive to recognize audio CDs and play them through the external audio jacks.

The future

Three groups of users will likely invest in the new technology immediately. First are developers, who will need to be CD-ROM–literate to communicate with NeXT into the future. Everything from interim releases to technical documentation updates are likely to be only on CD-ROM. Second are large sites, which will need on-site CD-ROM drives to update their multiple machines. Individual users in graphic arts, desktop publishing, and financial analysis who need data distributed on CD-ROM are also likely customers.

In the long run, most users will probably end up with CD-ROM drives. Besides giving access to the entire NeXTstep Extended Edition, the CD-ROM drive will open up a world of data opportunities for a very nominal cost.

DAN LAVIN *and* SIMSON L. GARFINKEL *are* NeXTWORLD *senior editors. Garfinkel wrote the NeXTstep CD-ROM file system under contract to NeXT.*

Goodbye Optical Disk

With the adoption of CD-ROM, NeXT closes the book on one of the most innovative technologies of the original NeXTcube. The Cube's optical disk was touted as a single device that could be used for both storing and moving around information. And it stored enough data – 256MB – to hold an entire NeXTstep software distribution, including Digital Webster and Shakespeare's complete works.

But the optical drive had problems with speed and reliability. It was just too slow for general use – so slow that NeXT was forced to provide customers of its optical disk-only systems with a 40MB accelerator hard disk for swapping. Although NeXT overcame the initial reliability problems with add-on dust filters, other reliability problems remained.

But what ultimately killed the optical disk was the cost of the optical cartridge itself. At more than $100 per disk, the system was just too expensive for software distribution. Third-party software developers balked at distributing programs on a disk that cost so much.

NeXT overcame its third-party software distribution problems when it announced the NeXT floppy disk with its new line of NeXTstations in 1990. Application programs that were dwarfed by the optical disk's massive data capacity fit nicely on a few low-cost 3.5-inch floppy disks.

Unfortunately, some kinds of applications demand much more storage than the 1.44MB or 2.88MB that a floppy disk can provide. The NeXTstep Extended Edition eats up over 200MB – more than 70 expensive 2.88MB floppy disks, even with data compression. And multimedia databases with sound and images can take up far more.

What's Hot
eep up with the hottes
mputer market in the
ges of NeXTWORLD
he only magazine ded
NeXT computers.
NeXTWO

SIMSON00000872

SIMSON0000873

hem is by using a PC data
gine. For that reason, NeXT
with Insignia Solutions to
ftPC's handling of the CD-
e.
: CD-ROMs mastered in
osh HFS format are likely
roublesome for NeXT users
me to come, Barry Cinna-
nem less of a factor in the
hink that everybody's mov-
9660," he says. Disks for-
HFS can't be read on IBM

ional software under devel-
NeXT should allow the
cognize audio CDs and play
igh the external audio jacks.

iture

ips of users will likely invest
technology immediately.
evelopers, who will need to
OM–literate to communicate
T into the future. Everything
im releases to technical doc-
n updates are likely to be
D-ROM. Second are large
h will need on-site CD-
es to update their multiple
Individual users in graphic
op publishing, and financial
no need data distributed on
I are also likely customers.
e long run, most users will
nd up with CD-ROM
ides giving access to the
XTstep Extended Edition,
OM drive will open up a
lata opportunities for a very
ost.

AVIN *and* SIMSON L.
NKEL *are* NeXTWORLD
rs. Garfinkel wrote the NeXTstep
file system under contract to

What's NeXT?

Keep up with the hottest computer market in the pages of NeXTWORLD. The only magazine dedicated to NeXT computers.

NeXTWORLD

Find out what's next and save MONEY too!

Yes! Please start my subscription to NeXTWORLD for just $23.95. I'll get 4 quarterly issues, plus an *additional* 8 BONUS issues of NeXTWORLD EXTRA–the NeXTWORLD newsletter that's *guaranteed* to keep me informed with up-to-the-minute facts about the hottest computer market. SEND NO MONEY NOW. We'll bill you later.

Name _____

Address _____

City _____ State _____ Zip _____

4FAC6

NeXTWORLD

CA residents add 7.25% sales tax. For Canada add $15 (includes 7% GST tax). All other foreign orders must be pre-paid in U.S. funds only and add $40 for airmail delivery or $15 for surface mail delivery. DO NOT SEND CASH. Check or money order accepted. FAX: 1-415-442-1891 to charge Visa/MC.

NeXTWORLD FOR ONLY $23.95! That's 40% OFF the regular subscription price.

Get a friend into NeXTWORLD for only $23.95

Yes! Please start my subscription to NeXTWORLD for just $23.95. I'll get 4 quarterly issues, plus an *additional* 8 BONUS issues of NeXTWORLD EXTRA–the NeXTWORLD newsletter that's *guaranteed* to keep me informed with up-to-the-minute facts about the hottest computer market. SEND NO MONEY NOW. We'll bill you later.

Name _____

Address _____

City _____ State _____ Zip _____

4FAC6

NeXTWORLD

CA residents add 7.25% sales tax. For Canada add $15 (includes 7% GST tax). All other foreign orders must be pre-paid in U.S. funds only and add $40 for airmail delivery or $15 for surface mail delivery. DO NOT SEND CASH. Check or money order accepted. FAX: 1-415-442-1891 to charge Visa/MC.

That's 40% OFF the regular subscription price.

Find out what's next and save MONEY too!

Yes! Please start my subscription to NeXTWORLD for just $23.95. I'll get 4 quarterly issues, plus an *additional* 8 BONUS issues of NeXTWORLD EXTRA–the NeXTWORLD newsletter that's *guaranteed* to keep me informed with up-to-the-minute facts about the hottest computer market. SEND NO MONEY NOW. We'll bill you later.

Name _____

Address _____

City _____ State _____ Zip _____

4FAC6

NeXTWORLD

CA residents add 7.25% sales tax. For Canada add $15 (includes 7% GST tax). All other foreign orders must be pre-paid in U.S. funds only and add $40 for airmail delivery or $15 for surface mail delivery. DO NOT SEND CASH. Check or money order accepted. FAX: 1-415-442-1891 to charge Visa/MC.

NeXTWORLD FOR ONLY $23.95! That's 40% OFF the regular subscription price.

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1140 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NEXTWORLD
SUBSCRIPTION DEPARTMENT
P.O. BOX 56429
BOULDER, CO 80323-6429

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1140 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NEXTWORLD
SUBSCRIPTION DEPARTMENT
P.O. BOX 56429
BOULDER, CO 80323-6429

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1140 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NEXTWORLD
SUBSCRIPTION DEPARTMENT
P.O. BOX 56429
BOULDER, CO 80323-6429

What's Next?

Find out in NeXTWORLD the only magazine dedicated to NeXT computers.

NEXTWORL

An
S
Al

Revolut
NeXTs

When NeXTstep won't find the ma acterized the leap focus this time is c base, and commu as on filling out ex new features.

Support for 3 new, PostScript- panache to the N Support for Nove DBKit, announce entrance, along v PostScript Level A new Help facili novices to learn t puting. These an tions, together wi fabric, will make NeXTstep.

Release 3.0 w and preinstalled was not available Version will be a installed on large tion will be prin

By C

SIMSON00000875

Another Step Ahead

♣

Revolution or evolution? NeXTstep 3.0 is both

When NeXTstep 3.0 arrives this March, you won't find the major interface changes that characterized the leap from Version 1.0 to 2.0. The focus this time is on breakthrough graphics, database, and communications capabilities, as well as on filling out existing functionality with robust new features.

Support for 3-D graphics, in the guise of a new, PostScript-compatible 3DKit, will add panache to the NeXT's already-rich graphics. Support for Novell and Apple networks and the DBKit, announced last year, will also make their entrance, along with the promised support of PostScript Level 2 and Pantone color matching. A new Help facility at the system level will allow novices to learn the tricks of interpersonal computing. These and other, less-ballyhooed additions, together with nips and tucks to the existing fabric, will make for a tighter and more robust NeXTstep.

Release 3.0 will be available on floppy disk and preinstalled on all new hard drives; pricing was not available at press time. The Extended Version will be available on CD-ROM and preinstalled on larger hard drives. New documentation will be printed by Addison-Wesley and available in bookstores, including a brand-new version of the *NeXTstep Concepts* manual (the current one is two releases out of date). With this release, NeXT has opted not to update many of the Demos, and some have been deleted altogether. NeXT will, however, continue to provide Developer Examples, and there may be periodic CD-ROM distributions of new Demos and Examples.

by Charles L. Perkins

Entering the third dimension

With release 3.0, NeXTstep introduces a fast system for creating and displaying three-dimensional images: 3DKit. The basis for this new kit is RenderMan, the de facto standard for three-dimensional rendering languages developed by Pixar, the Point Richmond, California, company owned mostly by NeXT CEO Steve Jobs.

RenderMan was originally a relatively slow, noninteractive language. As it did in turning PostScript into Display PostScript, NeXT has created a special version of RenderMan that can image quickly enough to give an interactive feel to working in 3-D. RenderMan processes a description of the geometry, placement, and lighting for three-dimensional objects in a scene and then generates pictures (color TIFF images) that are as realistic as photographs.

With NeXT's RenderMan, users will get a single, overall controller that lets them decide how long RenderMan should spend rendering images. One extreme will produce low-quality images quickly; the other will produce photo-realistic images in minutes, hours, or days. In addition, users can interactively fine-tune other aspects of rendering to further trade off quality versus speed. For example, users can select rendering with wire-frame or solid figures, specify the number of light sources, the degree of linearization, and the use of different shading techniques. Whether NeXT has achieved its goal of low-quality rendering in approximate real time is unknown, but the prospect seems likely.

For developers, the best news is that 3DKit is fully integrated with every aspect of the NeXTstep environment. RenderMan images have alpha transparency and can be mixed or composited with PostScript in any view on the screen.

PostScript in a view with a three-dimensional image appears to be painted on a glass sheet in front of the RenderMan scene. A clever programmer, however, can trick the 3-D image into appearing in front of the PostScript output via compositing. Any three-dimensional image can be

NeXTstep 3.0 Highlights

RenderMan bundled to provide full support for 3-D imaging

Database Toolkit

Full support for English, French, Spanish, German, Italian, and Swedish

A systemwide Help facility, used by both NeXT and third-party developers

Encryption of electronic mail

Direct support for AppleShare and Novell networks over Ethernet

Direct support for Macintosh 1.44MB floppy disks

Better handling of sound

printed on any PostScript printer, in black and white or color.

NeXT's 3DKit simplifies the developer's task of creating a complicated three-dimensional scene. A programmer need only describe the geometry of the objects and their relationships in a single method called **renderSelf:** (analogous to **drawSelf:** in the two-dimensional PostScript world).

None of this simplicity hides the true power of RenderMan. Sophisticates can get their hands on all the controls. Printing a scene reimages the RenderMan for the printer resolution, so the kit is as device-independent as PostScript. New user-interface objects will be available for "virtual sphere" displays and mouse-point-to-ray conversions that will make writing new 3-D–smart applications easier.



Renderings like this one are now easily created with NeXTstep 3.0's 3DKit.

Connectivity and interoperability

NeXTstep 3.0 will be even more network-friendly than the old: NeXT computers will now fit comfortably into most PC and Apple networks. NeXT's general strategy here is to provide client support for each existing network standard. To the network server, the NeXT doesn't look like a NeXT. On a Novell network, it looks like a PC running MS-DOS; on an AppleShare network, the NeXT looks like a Macintosh. Unfortunately, NeXT has enabled connectivity only with Novell and AppleShare clients – neither PCs nor Macs can access files stored on NeXT file servers unless the the client machines are equipped with third-party NFS packages.

Within the DOS world, the NeXT will now interoperate as a full Netware 286 or 386 client in any Novell network. Since Novell has about 60 percent of the PC networking market, this is a good place to start. Novell file servers will pop up in the Workspace Manager's File Viewer just as other NeXT (NFS) file servers do now, with the only caveat being the usual necessary DOS/UNIX filename translations. Printers shared on the Novell network can be loaded into NetInfo and used as well.

Within the Macintosh world, the NeXT will act as a full AppleShare client. Volumes exported to the network at large will again pop up in the File Viewer as new "places" in /Net, and any printers shared on the network can again be loaded into NetInfo for shared use among all NeXT machines.

All of this new network support runs on the Ethernet. This is not usually a problem on PC networks, since most use Ethernet, but an Ethernet-to-AppleTalk bridge (available from third parties) is necessary to access many Macintosh networks. Full Macintosh floppy-disk support was added to 3.0, allowing 1.44MB Mac disks to be as easily loaded into any NeXT machine as DOS disks can be now. Unfortunately, reading low-density, 800KB disks still requires using an external floppy drive.

Finally, NeXT is trying to pull wide-area networks into the digital age. Starting with Release 3.0, NeXT will begin a long-term commitment to Integrated Services Digital Network (ISDN) networking with the goal of allowing users to see the same network environment (file servers, printers, real-time mail delivery, database servers, and so on) at home as they do at work, albeit with significantly slower performance (ISDN is at best about 80 times slower than your Ethernet at work). By building fast, SLIP-like networking into the system, NeXT will allow customers with ISDN to have real-time, Internet-like access to their company network (and whatever networks it is attached to) at about four times the speeds available today with low-cost 9600-baud modems. This long-term strategy should already pay off for NeXT in the international market, which accounts for about 50 percent of NeXT sales.

For developers, mostly

In addition to various small additions to the AppKit itself, and a new graphical debugger, NeXT will be providing a new system for accessing information stored in databases: DBKit. [See "Covering the (Data) Bases," *NeXTWORLD* Fall 1991, for more information about DBKit.]

The DBKit integrates fully into the NeXTstep environment as a format-independent facility for accessing, manipulating, and searching through arbitrary data sources. These sources could be real-time data feeds, flat files, relational databases, or even nonrelational databases located elsewhere on a network. The DBKit is both a set of user-interface objects to help write database applications and several general sets of objects that implement all the hard work for you. A layer of high-level objects hides the details of the data formats and the languages you need to speak to get to the data. These objects even allow simple intersections between two sets of data, without requiring any reference to the underlying database language. Like the Window objects in the AppKit, which hide the Window Server's PostScript environment, these objects can perform caching, efficient compiling, and buffering, yet look simple to use from the outside.

Another set of objects, called "adapters," bridges the gap between the high-level objects described above and the actual low-level details of dealing with a particular database. Adapters for Sybase and Oracle (and possibly a simple Developer Example of using a flat file) will be bundled with the system, but NeXT hopes that by documenting all the interfaces and the methods for creating adapters, third-party developers will fill in any missing pieces. The system works a little like the Services menu: Any added adapters will be automatically supported by all existing (older) applications. In addition, developers selling database-like applications (for example, DataPhile) will be able to bundle adapters with their applications, making them instantly interoperable with applications designed for use with other database systems. This general database-independence should be an extremely attractive lure to database users, and a compelling reason to create new database applications on the NeXT rather than elsewhere.

Finally, Interface Builder has been completely rewritten for 3.0 in order to accommodate the changes required by DBKit and the on-line Help facility, and to meet the new requirements for internationalization.

New systemwide facilities

NeXTstep 3.0 will support six languages out of the box: English, French, Spanish, German, Italian, and Swedish.

(Japanese will still be shipp
rate package.) Furthermore
panel messages, help inforr
facilities that come in the s
(105MB) version of the rel
ing all of /NextApps), wil
internationalized. This wil
selling point to the growin
of multinational corporati
machines can be moved fr
to country by just clicking
language in the Preferences
(the power supply automati
NeXT has also improved s
internationalization in Inte
and elsewhere, allowing th
developers to easily tag alo

New support for Pan
and a move to fully suppo
Level 2 up the ante in the
against Macintosh-based c
publishing systems. With
NeXT will be the first co
to implement Display Pos
2, and will be one of the fi
nies to ship a Level 2 prin
NeXT Color Printer (see
Everyone" in this special r
changes will have a major
NeXT's ability to support
color into the mid-'90s.

Improvements to the
of the system will allow m
cations to produce sound
time (for example, allowin
beep to be heard even whi
a Bach fugue via ScorePlay
tion, access to the micropl
is no longer limited to a si
tion, opening up the possi
smart, background-voice-r
applications that do not lo
voice-mail applications. N
will include a wider range
sized instruments (includi
woodwinds), along with p
port for MIDI/SMPTE s
graphics and video.

Data encryption will
in the Workspace Manag
applications. Using dynan
public-key encryptions, it
each mail message sent by

SIMSON00000876

SIMSON00000877

(Japanese will still be shipped as a separate package.) Furthermore, all pop-up panel messages, help information, and facilities that come in the standard (105MB) version of the release (including all of /NextApps), will be fully internationalized. This will be a unique selling point to the growing number of multinational corporations: NeXT machines can be moved from country to country by just clicking the local language in the Preferences application (the power supply automatically adapts). NeXT has also improved support for internationalization in Interface Builder and elsewhere, allowing third-party developers to easily tag along.

New support for Pantone colors and a move to fully support PostScript Level 2 up the ante in the contest against Macintosh-based color desktop-publishing systems. With Release 3.0, NeXT will be the first company to implement Display PostScript Level 2, and will be one of the first companies to ship a Level 2 printer: the new NeXT Color Printer (see "Color For Everyone" in this special report). These changes will have a major impact on NeXT's ability to support professional color into the mid-'90s.

Improvements to the sound layers of the system will allow multiple applications to produce sound at the same time (for example, allowing the system beep to be heard even while listening to a Bach fugue via ScorePlayer). In addition, access to the microphone input is no longer limited to a single application, opening up the possibility of smart, background-voice-recognition applications that do not lock out normal voice-mail applications. NeXTstep 3.0 will include a wider range of synthesized instruments (including brass and woodwinds), along with possible support for MIDI/SMPTE sequencing of graphics and video.

Data encryption will be included in the Workspace Manager and Mail applications. Using dynamically picked public-key encryptions, it will allow each mail message sent by a user to be almost guaranteed as unreadable by others as it travels over networks (once delivered and read by the recipient, it will no longer be protected). In addition, a variant will be used to allow a user's individual files to be protected to the same degree against compromise. A password will be used to lock and unlock each file, which will be unreadable without the password, even to the superuser. Encryption will be only a click away: It will be fully integrated into the File Viewer.

Unfortunately, the new NeXT mail system does not use the Internet encryption standard for privacy-enhanced mail, and therefore NeXT users cannot exchange encrypted mail with other users on the Internet. Instead, NeXT is using a new encryption technique called FEE (Fast Elliptic Encryption), which NeXT claims is more secure than many existing encryption systems. However, the company refuses to disclose any technical details on the algorithm, saying that it is filing for a patent on the process.

NeXT has fixed the annoying bugs with cut-and-paste and rich text: Now any RTF text with pictures in it (RTFD format) can be safely copied and pasted throughout the system without it losing its pictures, as often happened in Release 2.0.

Also in NeXTstep 3.0, Icon will be replaced by a new, fully supported paint and icon-creation tool in /NextDeveloper/Apps. The new tool has a subset of Icon's current functionality. NeXT also plans more-extensive support for fax reception and dispatch, although few details about fax software were available at press time.

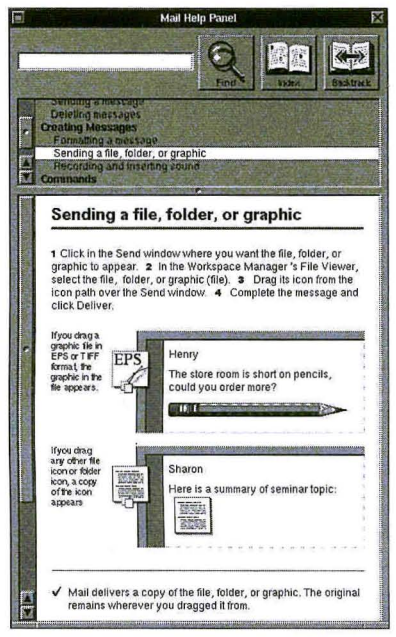
Help for us all

Using NeXTstep 3.0 should be easier thanks to an on-line help system. Simple, elegant, and well thought-out, the new facility is at once both a user- and developer-oriented feature. For users, NeXT will provide small on-line help manuals for many of the key NeXT applications (definitely for Workspace Manager, Mail, Preferences, Edit, and FaxReader; others may be included or will follow in future releases).

But that's not all. In addition, context-sensitive help will be available for all these applications and for all the standard pop-up panels and facilities of Release 3.0. The system is similar to Lotus Improv's help system. The user simply clicks on a menu item, or holds down certain shift keys, and then clicks a screen object (like a button) to inquire about its use. One thing that sets the NeXT facility apart is that the Help screens are not simply PostScript images, but full RTFD files that can be copied, pasted, and searched through the Find panel.

Each application will have its own Help panel, which looks somewhat like the Digital Librarian search window. A fast, global find using indexes is available (separate from the normal Find panel), as is a button for reaching the index and another for navigating backward to whatever Help screen was last viewed. This latter feature is crucial in any hypertext document: It keeps you from getting lost when wandering through parts of a manual. As you page through the various Help screens, following "see also" or cross-references, the system keeps track of your path, and you can reverse-navigate the path back to where you started by pushing a backtrack button as many times as you want. The index and table of contents are both hyperlinked as well, so touching an entry in either whisks you directly to the referenced part of another Help screen.

For developers, NeXT has provided a simple way to incorporate the new hypertext help into application programs: The table of contents, index, and Help screens are all instances of the same general View, which can contain RTF, pictures, and hyperlinks to markers in other such Views. These markers can be placed anywhere in the middle of a newly created RTF stream (presumably by Edit), and mark the end points of links. Whole hierarchies



In the new help system, users simply click on a screen object to inquire about its use.

of Help screens can be duplicated with links intact. That's a helpful way to get started based on an existing NeXT application's help tree. Being able to duplicate a hypertext tree will also speed the process of translation and internationalization of the Help facility.

Finally, Interface Builder has been modified so that objects on the screen can be graphically connected with their associated markers in the Help files. Soon any NeXT application without on-line help will not be considered a true NeXT application.

A spring revolution

With the arrival of 3.0, NeXT has raised the ante on system-software functionality and performance. Its improved networking and intercommunication facilities, 3-D graphics, and new hypertext Help system are all welcome improvements to an already robust environment. And it also contains a few revolutionary items that should motivate even the most jaded 2.0 user to make the leap to 3.0.

CHARLES L. PERKINS,
a contributing editor of NeXTWORLD, *is president of The Cube Route and founder and president of Harvard Square Software.*



What if you could be as smart as this.



Organized as this.

SIMSON00000879



as this.



Communicate like this.

Think. Organize. Communicate. Few are born with the ability to excel at all three. One software system is. *Who's Calling?* The most advanced contact management and scheduling program there is. With modules for group scheduling, tracking client information, conversation histories and live network messages. *Who's Calling?* has multi-media capability. And plenty of flexibility and power–as much for the single user as for the network. The program can be modified to fit each user's needs or Adamation can tailor custom applications into *Who's Calling?* If you want your business to think better, plan better, and communicate better, act today. Contact your NeXT reseller or NeXTConnection at 1(800) 800-NeXT for pricing and ordering information.

Who's Calling?™

WHO'S CALLING? *from* ADAMATION.

For productivity,
it's the NeXT logical step.

Circle 8 on reader service card

Exstensible and reusable, object "building blocks" are the foundation of the future.

OBJECT LESSONS

When Apple and IBM announced last October that they would build an object-based operating system for a new generation of RISC-based personal computers and workstations, no one applauded more loudly than NeXT Computer. ➢ "They're out there now getting the press, the public, and everyone educated about object-oriented operating systems,"

says Ava
tem soft
years, if
we are
compar
Microsy
object-b
edge ne
expecta
worksta

NeXT OBJECT TECHNOLOGY

MACH: THE MED

BETWEEN THE VARIO
COMMUNICATION. AL
SYSTEM – ARE HAND

CURRENTLY, NE
THE KERNEL, AND T
SYSTEM.

WHILE MACH IS
GRAMMERS TO MAKE
MADE TO THE OPERA
THE MACH KERNEL W
GET LOADED, WHICH

BY DESIGN, MAC
MESSAGES, PROGRA
OTHER – VIA A SPEE

MACH HAS BUIL
OF THREADS. THREA
FOR EXAMPLE, USES
NETWORK.

WHAT'S MISSING
CMU. (NEXT USES
ING TO AVIE TEVANI
MACH 3.0 IS THE AB
APPLICATION PROGR
BY SPECIFYING DIFF

SIMSON00000880

SIMSON00000881

nounced
y would
ng system
C-based
kstations,
dly than
ey're out
ess, the
ed about
ystems,"

T

S

says Avadis (Avie) Tevanian, director of system software for NeXT. "In three to five years, if they're lucky, they'll have what we are offering our customers today." ➢ What do companies like Apple, IBM, Microsoft, and Sun Microsystems hope to gain by following NeXT into object-based environments? Possibly the competitive edge needed to keep up with customer demands and expectations in the global personal computer and workstation markets. →

BY CONNIE GUGLIELMO

☆

SIDEBARS BY SIMSON L. GARFINKEL

MACH: THE MEDIUM IS THE MESSAGE

AT THE HEART OF THE NEXT COMPUTER IS THE MACH OPERATING SYSTEM, DEVELOPED AT CARNEGIE MELLON UNIVERSITY (CMU) DURING THE 1980S. MACH IS A MICROKERNEL OPERATING SYSTEM THAT DIVIDES THE CPU BETWEEN THE VARIOUS PROCESSES THAT ARE READY TO RUN, MANAGES THE ALLOCATION OF MEMORY, AND PROVIDES FOR INTERPROCESS COMMUNICATION. ALL OTHER FUNCTIONS NORMALLY PROVIDED BY AN OPERATING SYSTEM – INPUT/OUTPUT, NETWORK CONTROL, THE FILE SYSTEM – ARE HANDLED BY OTHER PROGRAMS CALLED SERVERS.

CURRENTLY, NEXT'S MACH OPERATING SYSTEM HAS JUST TWO SERVERS: THE KERNEL SERVER, WHICH LOADS NEW MODULES INTO THE KERNEL, AND THE UNIX SERVER, WHICH PROVIDES MOST OF THE FUNCTIONS OF THE STANDARD BERKELEY 4.3 UNIX OPERATING SYSTEM.

WHILE MACH IS NOT STRICTLY AN OBJECT-ORIENTED SYSTEM, ITS MICROKERNEL DESIGN MAKES IT CONSIDERABLY EASIER FOR PROGRAMMERS TO MAKE CHANGES OR ADDITIONS TO THE DEPTHS OF THE OPERATING SYSTEM. LOADABLE DRIVERS ALLOW PATCHES TO BE MADE TO THE OPERATING SYSTEM WHILE IT IS RUNNING; FOR EXAMPLE, THE NEXT CD-ROM AND DOS FILE SYSTEMS ARE LOADED INTO THE MACH KERNEL WHEN A CD-ROM OR DOS DISK IS INSERTED INTO THE COMPUTER. IF NO DISK IS INSERTED, THE FILE SYSTEM DOESN'T GET LOADED, WHICH SAVES MEMORY.

BY DESIGN, MACH SUPPORTS A HIGHLY EFFICIENT SYSTEM FOR INTERPROCESS COMMUNICATION CALLED MESSAGING. BY USING MACH MESSAGES, PROGRAMS CAN COMMUNICATE WITH THE MICROKERNEL – OR PARTS OF THE MICROKERNEL CAN COMMUNICATE WITH EACH OTHER – VIA A SPEEDY PROTOCOL THAT IS EASY FOR THE PROGRAMMER TO IMPLEMENT.

MACH HAS BUILT-IN SUPPORT FOR ALLOWING ONE PROGRAM TO DO MORE THAN ONE THING AT THE SAME TIME THROUGH A SYSTEM OF THREADS. THREADS ARE SO EASY TO USE THAT THEY'RE SHOWING UP IN ALL SORTS OF PROGRAMS. LIGHTHOUSE DESIGN'S GAME, VOID, FOR EXAMPLE, USES THREADS FOR BOTH MANAGING SOUND AND ALLOWING COMMUNICATION BETWEEN DIFFERENT PLAYERS ON THE SAME NETWORK.

WHAT'S MISSING FROM NEXT'S IMPLEMENTATION OF MACH IS MANY OF THE NEW FEATURES IN THE 3.0 VERSION AVAILABLE FROM CMU. (NEXT USES MACH 2.5, AND WILL CONTINUE TO DO SO THROUGH NEXTSTEP 3.0, OR UNTIL MACH 3.0 IS MORE STABLE, ACCORDING TO AVIE TEVANIAN, WHO HEADS NEXT'S SYSTEM SOFTWARE GROUP.) FOR BUSINESS USERS, THE MOST IMPORTANT NEW FEATURE IN MACH 3.0 IS THE ABILITY TO SPECIFY DIFFERENT VIRTUAL MEMORY "PAGERS" FOR DIFFERENT PROCESSES. THIS WOULD LET DATABASE APPLICATION PROGRAMS MANAGE THEIR VIRTUAL MEMORY SPACE DIFFERENTLY (AND POSSIBLY MORE EFFICIENTLY) THAN THEY CAN NOW, BY SPECIFYING DIFFERENT ALGORITHMS FOR DETERMINING WHEN DATA SHOULD BE MOVED FROM RAM TO THE COMPUTER'S HARD DISK.

Objects of desire

Object-oriented operating systems have suddenly become the "must have" of the computer industry – but in a sense, object-oriented programming is as old as programming itself. It codifies clever strategies painstakingly developed over the decades into a new, coherent whole. But it also goes beyond those strategies to suggest new ways of viewing the process of programming.

In traditional programming, programmers write functions and procedures, each solving a particular problem in a particular way. Although procedures can isolate parts of a program from one another, dependencies between different procedures inevitably creep into the system. When part of a program depends inextricably on another part thousands of lines away, a single change in an innocuous subroutine can cause the entire application to come crashing down.

In the late 1960s, the first object-oriented language, Simula, was developed. Simula was designed to model the interactions between objects in an event-driven way, and all object-oriented environments still reflect this heritage.

The real flowering of object-oriented programming began in the 1970s at Xerox Palo Alto Research Center, where the language SmallTalk was created and refined. SmallTalk introduced a pure and extremely simple model for both the language and its environment, creating an exciting new synthesis between the user interface and its underlying language.

In parallel with these developments, programmers using more-traditional languages tried to graft on object-oriented features. In the early 1980s, Brad Cox succeeded in developing a hybrid of SmallTalk and C called Objective C, which is the basis of NeXT's object-oriented environment, NeXTstep. Objective C trades a good deal of the power and flexibility of SmallTalk for the speed and programmer familiarity of C, but it has gained back some of SmallTalk's flexibility as NeXT has enhanced it over the years. Finally, in the mid-1980s, Bjarne Stroustrup at AT&T Bell Labs created a new casting of C called C++, which is claimed to be an object-oriented language. While C++ lacks most of the features that make object orientation most flexible, it nonetheless provides all the modularity and design advantages of an object-structured model.

NeXT Object Technology • Objective C: Seeing is believing

Objective C is a blend of the ANSI C language and SmallTalk, an object-oriented language developed at Xerox Palo Alto Research Center in the 1970s. The hybrid language, developed by Brad Cox in the early 1980s, lets the programmer create tiny, self-contained "objects" that can receive messages and perform functions on data they contain.

The most important feature of Objective C, supporters say, is run-time binding: You don't need to know what an object is before you send it a message. Run-time binding lets different objects respond to the same message in different, but functionally similar, ways. More importantly, it frees the programmer from having to know all the details about the application program's run-time environment at the time the application is being written.

For example, a headline and a photograph on the NeXT's screen are represented by different objects inside the computer's memory. Both of these objects, however, respond to the drawSelf: method to make themselves appear. A drawing program doesn't need special-case code to handle all the different kinds of objects that a user can draw on the screen – it just sends every object a drawSelf: message, and the objects do the rest of the work for themselves.

Closely coupled with run-time binding is NeXT's dynamic loading of run-time libraries. Instead of linking libraries into each application program, they are kept in a "shared library" on the disk that is loaded when an application program is run. This saves space on the disk. More importantly, it lets NeXT upgrade the shared library and have that change reflected automatically in existing application programs.

Another advantage of Objective C, says Andrew Stone of Stone Design, is clarity. "It's self-documenting. You tend to name variables by what they do, and you can read it almost like English," he says.

Objective C uses a technique called subclassing to allow programmers to create new kinds of objects out of old ones. Programmers can subclass both their own objects and those objects suppled by NeXT. For example, by subclassing the scroller, a programmer can create a scroller that also displays a zoom selector or a page counter.

What about C++, the object-oriented language that's become an industry standard outside the NeXT community? "There is nothing about C++ that invites you to write good object-oriented programs," says Stone.

Advantage of objects

In an object-based world, programmers create easily modifiable, extensible, and – most importantly – reusable building blocks of programming code. The blocks, or objects, are stand-alone components of data and program code that know how to do something. Objects not only know what they can and can't do, they also know how to communicate with other objects through "messages."

A programmer can create objects for handling common tasks – for instance, drawing windows on a screen – and reuse those objects when building a new application. Object reusability means that, in most cases, application development is faster. Because they don't have to rewrite the same routines each time they create an application, programmers taking an object-based approach can build software 3 to 10 times faster than programmers using procedural languages. That's significant, considering it takes programmers, on average, 18 months to develop a new application using the traditional method.

In a world where new microprocessor technology doubles hardware performance about every two years, the benefit of an approach that helps bring software to market faster is obvious. "I can't imagine software developers going any other way but object-oriented programming. It's a fundamental, but necessary, change in the way software is assembled," says Michael Goulde, an analyst with Boston-based Open Systems Advisors. "The ability to rapidly prototype and rapidly develop is extremely important in today's global economy. Competitive pressures are such that two- and three-year product development cycles are just not acceptable, if you want to survive."

Object-based environments like SmallTalk and NeXTstep bring the benefits of object-based program-

When yo
purchase a Ne
computer, one
floppy disk co
with it.
The onl
floppy disk go
enough for the
Toshiba'
2.88MB of forr
Toshiba
recording mec
invented the r
recording tech
more importa
standard in di
new media tec
Today T
© 1991 Toshiba America Electronic

SIMSON00000882

SIMSON00000883

tage of objects
ject-based world, program-
ate easily modifiable,
e, and – most importantly –
building blocks of pro-
g code. The blocks, or
re stand-alone components
nd program code that
w to do something.
ot only know what they
can't do, they also know
ommunicate with other
rough "messages."
ogrammer can create
or handling common tasks
ance, drawing windows on
– and reuse those objects
lding a new application.
usability means that, in
es, application develop-
aster. Because they don't
ewrite the same routines
they create an applica-
grammers taking an
sed approach can build
3 to 10 times faster than
ners using procedural lan-
hat's significant, consider-
es programmers, on
18 months to develop a
ication using the tradi-
thod.
world where new micro-
technology doubles hard-
formance about every two
benefit of an approach
bring software to market
bvious. "I can't imagine
developers going any
but object-oriented pro-
g. It's a fundamental, but
, change in the way soft-
ssembled," says Michael
n analyst with Boston-
en Systems Advisors.
ity to rapidly prototype
ly develop is extremely
t in today's global econ-
npetitive pressures are
two- and three-year prod-
opment cycles are just not
e, if you want to survive."
ct-based environments like
and NeXTstep bring the
f object-based program-

Make Toshiba Your NeXT Disk.



When you purchase a NeXT computer, one superfloppy disk comes with it.

The only superfloppy disk good enough for the NeXT generation of computers.

Toshiba's extra-high density disk with 2.88MB of formatted storage (4MB unformatted).

Toshiba developed barium ferrite as a recording medium more than 14 years ago. We invented the revolutionary perpendicular recording technology that goes with it. And, more importantly, we created a whole new standard in disk manufacturing to match this new media technology.

Today Toshiba's barium ferrite 2.88MB disks are the standard for performance and reliability. A standard other manufacturers will be pursuing for years to come.

Available individually, or in boxes of five or ten, we've made it easy for you to follow NeXT's cue when you buy another superfloppy disk.

Just make the Toshiba 2.88MB disk your NeXT.

And your NeXT.

And your NeXT.

Call 1-800-843-2108 for the name and number of the Toshiba dealer nearest you.

In Touch with Tomorrow

TOSHIBA

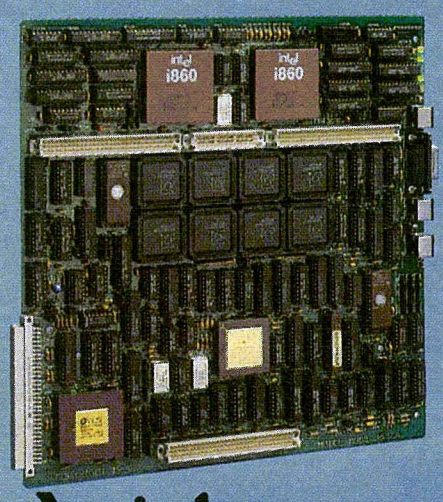
Circle 35 on reader service card

TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC.

© 1991 Toshiba America Electronic Components, Inc. Product and or brand names mentioned herein may be trademarks or registered trademarks of their respective companies. MMOD-91-03

Ariel's IRCAM Signal Processing Workstation

The NeXT Plateau



- Two i860 RISC processors for 160 MFLOPS (93.5 MIPS) power
- 13.5 MIPS DSP56001 for I/O processing
- Up to 64 Mbytes of memory
- 100 Mbyte/sec. transfer rate
- Real-time operating system
- Graphical and object-oriented programming environments
- Software development platform

Ariel's IRCAM Signal Processing Workstation is more than the most powerful calculation engine for the NeXT Cube. It's a complete real-time supercomputing environment...and a new plateau for the NeXT.

Call Ariel at (908) 249-2900 to learn about IRCAM and Ariel's DatPort, ProPort, and QuintProcessor products for the NeXT.

Ariel _

The DSP Authority

433 River Road, Highland Park, NJ 08904
(908) 249-2900 • FAX: (908) 249-2123
DSP BBS: (908) 249-2124 • Email: ariel @ ariel.com

Circle 23 on reader service card

Here's the Missing Link your NeXT has been looking for.

eXodus™ *for the* NeXT computer.

From the developers of eXodus for the Macintosh, an X Window Display Server that lets your NeXT computer communicate with VAX, Sun, HP, Prime or any other host using the X Window System.

Available in March... and well worth the wait!

For more information, call or write
White Pine Software,
40 Simon Street, Suite 201,
Nashua, NH 03060-3043.
Tel: (603) 886-9050.
Fax: (603) 886-9051.

WHITE PINE SOFTWARE

Circle 37 on reader service card

ming to a system-software level. Like any object-based application, the object-based operating system may be more reliable and flexible than procedural-based operating systems, because the core system objects can be easily modified to correct problems and extended to add functionality.

But while SmallTalk offered developers an easy way to deliver applications, it lacked a way to build interfaces, according to Paul Hegarty, director of NeXTstep software at NeXT. "SmallTalk was proof of concept," he said. And a concept it stayed. Hardware vendors were reluctant to take what was then viewed as too much of a risk. "I think it's a classic thing. Computer companies are cautious about jumping on new technologies. But as a start-up, NeXT had to take a risk six years ago."

OOP Bandwagon

NeXT's risk appears to be paying off. Object-oriented software has become the buzzword of the era, and virtually every major company has endorsed one environment or another.

IBM and Apple plan to jointly own and operate Taligent, a San Francisco Bay Area company expected to deliver an object-based system sometime in the mid-1990s.

Taligent's operating system will be used by each of the former adversaries to develop new computer platforms in the late 1990s. It also will operate "in parallel to, and complement" Apple's existing Mac and IBM's OS/2 UNIX environments through a special set of objects called "personalities." In this way, customers will not lose their current software investment when switching to a Taligent OS-based system.

Apple's contribution to Taligent is Pink, an object-based system it has been working on for three years and that already encompasses "more than a million lines of code," according to executives of the company. IBM is contributing the object-based technology developed by year-old Patriot Partners, formerly a joint venture between IBM and Metaphor Computer Systems of Mountain View, California.

Microsoft Chairman Bill Gates, on the other hand, says his company's "object-oriented vision" of the future will be Windows NT (New Technology), a high-end version of the Windows environment due in 1992.

Meanwhile, Sun's system-software subsidiary, SunSoft, is promoting Solaris 2.0. SunSoft's new operating system, which will run both on Sun's SPARC architecture and on industry-standard 80386/80486 computers, will include OpenWindows Version 3, a programming environment containing object-based tools called ToolTalk. Sun is also at work on a joint object-development effort with Hewlett-Packard.

"If [Apple's] Sculley, [Microsoft's] Gates, and [IBM's] Cannavino agree on it, object-oriented programming must be a good thing," says Mike Slade, NeXT's director of marketing.

Advantage NeXT?

NeXT has spent the past five years building NeXTstep. NeXT built its environment with Objective C, which it chose over other languages such as Object Pascal and the more popular C++, because it felt Objective C was the best-integrated and easiest to learn, say Hegarty and Tevanian.

NeXTstep is also unlike other object-based systems because it was built as an object-based environment "from the ground up," says Hegarty. "Our competitors think that object-oriented programming is sort of an interface thing. The object-oriented world is integrated. Unless your entire system is object-oriented, it's not really going to work well. →

NeXT OBJECT TECHNOLOGY

APPLICAT LENDING

STEVE JOBS LIKES TO
AN OBJECT-ORIENTE
ONLY 10 PERCENT O
NEXTSTEP A FANTASTI
ENVIRONMENT. ANOTH
HAVING A LARGE LIB
TO-USE, RELIABLE OB
WHAT PROGRAMMERS

IN NEXTSTEP, TH
OBJECTS IS CALLED T
KIT. THE APP KIT IS
TAL COLLECTION OF
HANDLES EVERYTHIN
ING WINDOWS AND ME
ING THE NETINFO
COMMUNICATING BETW
PROGRAMS.

ONE OF THE MO
APPLICATION KIT OBJ
TEXT. IT PROVIDES TH
WITH A MULTIFONT TE
PLETE WITH CUT-AND
AND A SPELL-CHECKE
AND CANON WENT O
THE KANJI VERSION
MOST OF THE MAJOR
CONFINED TO THE TE
THE JOB WAS DONE
THAT USED THE TEX
LOTUS IMPROV – WO
CALLY WITH THE JAP

"THE APP KIT IS
DESIGNED," SAYS
FOUNDER OF LIGHT
"MOST OF THE TIME
TO DO SOMETHING,
LOOK TO THE APP KI

SINCE THE APP K
OBJECTIVE C AND
SHARED LIBRARY,
FREEDOM TO ADD FE
CHANGES TO THE O
JEOPARDIZING PROG
THEM. FOR EXAM
OBJECT'S SPELL-CHE
TO NEXTSTEP BETWE
AND 2.0; ANY PROG
THE TEXT OBJECT AU
THE NEW VERSION O

PROGRAMMERS C
MODIFICATIONS AND
OBJECTS BECAUSE O
ABILITY TO SUBCLAS
MENTIONED ABOVE.
THE APP KIT OBJEC
WHAT THE PROGRAM
DO, BUT NOT QUITE.

SIMSON00000884

SIMSON00000885

cording to executives of
any. IBM is contributing
:-based technology devel-
'ear-old Patriot Partners,
a joint venture between
Metaphor Computer Sys-
Mountain View, California.
osoft Chairman Bill Gates,
ıer hand, says his com-
bject-oriented vision" of
: will be Windows NT
hnology), a high-end ver-
e Windows environment
92.
ıwhile, Sun's system-
subsidiary, SunSoft, is pro-
olaris 2.0. SunSoft's new
system, which will run
ın's SPARC architecture
dustry-standard 80386/
mputers, will include
ıdows Version 3, a pro-
g environment containing
sed tools called ToolTalk.
o at work on a joint
velopment effort with
Packard.
Apple's] Sculley, [Micro-
es, and [IBM's] Cannavino
t, object-oriented pro-
g must be a good thing,"
: Slade, NeXT's director
ing.

age NeXT?

s spent the past five years
NeXTstep. NeXT built
ıment with Objective C,
hose over other languages,
bject Pascal and the more
C++, because it felt Objec-
s the best-integrated
:t to learn, say Hegarty
ıian.
Tstep is also unlike other
sed systems because it was
ı object-based environ-
ım the ground up," says
'Our competitors think
t-oriented programming
ın interface thing. The
ented world is integrated.
ur entire system is object-
it's not really going to
l. →

Application Kit: Lending Library

Steve Jobs likes to say that using an object-oriented language is only 10 percent of what makes NeXTstep a fantastic programming environment. Another big part is having a large library of ready-to-use, reliable objects that do what programmers need to do.

In NeXTstep, this library of objects is called the Application Kit. The App Kit is the fundamental collection of objects that handles everything from displaying windows and menus to managing the NetInfo database and communicating between different programs.

One of the most important Application Kit objects is called Text. It provides the programmer with a multifont text editor complete with cut-and-paste support and a spell-checker. When NeXT and Canon went off to develop the Kanji version of NeXTstep, most of the major changes were confined to the Text object. Once the job was done, any program that used the Text object – like Lotus Improv – worked automatically with the Japanese system.

"The App Kit is very, very well designed," says Alan Chung, founder of Lighthouse Design. "Most of the time when you want to do something, you can just look to the App Kit."

Since the App Kit is written in Objective C and stored in a shared library, NeXT has the freedom to add features or make changes to the objects without jeopardizing programs that use them. For example, the Text object's spell-checker was added to NeXTstep between versions 1.0 and 2.0; any program that used the Text object automatically got the new version of the object.

Programmers can make custom modifications and extensions to objects because of Objective C's ability to subclass an object, as mentioned above. This is handy if the App Kit object does almost what the programmer wants it to do, but not quite.

Backup without getting TAR and feathered.



If you're tired of struggling with cryptic UNIX backup utilities, now you can back up the way NeXT ™ intended you to – *easily and intuitively.* With a mere click of a button, *RunningBACK* brings you the first user-friendly, graphical interface tape archive software for NeXT computers.

Powerful features allow you to back up entire volumes or make sophisticated rule-based selections of individual files. Choose files by date, title, type, creator, or any combination of criteria. Or schedule unattended backups with convenient timer scripts.

RunningBACK's cursor sensitive help window eliminates backup frustrations providing real-time assistance. And it's multiplatform file format will allow data interchange with Macintosh computers.*

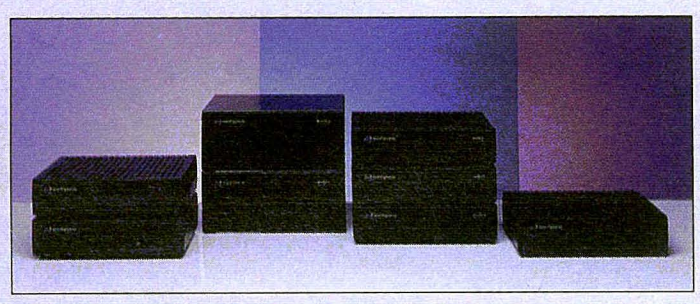
Bundled exclusively with the Microtech Eclipse 2.0T 2GB DAT drive, *RunningBACK* provides the only fast, network compatible tape backup application for NeXT computers. Unless, of course, you prefer TAR . . . and feathers.

For more information on *RunningBACK* or Microtech International's complete line of NeXT storage and memory products call:

800-325-1895

International inquiries: 203-468-6223.

Eclipse CD, Eclipse 2.0T Tape Backup, Eclipse internal and external hard drives from 200MB -1.3GB, Eclipse 50R Removable.



MICROTECH INTERNATIONAL, INC.

©1991 Microtech International, Inc., 158 Commerce Street, East Haven, CT 06512. All trademarks are the property of their respective owners.
*Requires purchase of RunningBACK software for the Macintosh. Microtech reserves the right to change specifications without notice.

Circle 2 on reader service card

→ "Object-oriented programming is not about collecting things into groups. It's knowing where the center of activities are in your program and factoring out the common code," he adds.

Furthermore, NeXTstep is essentially hardware-independent. "By enhancing our objects, we can handle any hardware. Porting NeXTstep to some other hardware platform would be very easy to do," says Hegarty.

While companies like Apple and IBM begin work on building their object libraries, NeXTstep already offers developers two important advantages: the Application Kit, a library of predefined objects; and Interface Builder, an object editor that lets developers quickly create a GUI (graphical user interface). (See the sidebars for a full description of these and other NeXTstep object-oriented features.)

"I expect that it chops development time in half or more," says Ray Ryan, software engineer with Lighthouse Design, a Chevy Chase, Maryland, NeXT developer. "That comes from having so many of the objects written for you in the Application Kit and having the tools so you don't have to reinvent the wheel."

How hard is it to build an object? It depends on what you want the object to do, say Hegarty and Tevanian. It has taken NeXT five years to create their current library of more than 100 objects. The more specific the task, the easier it is to create an object; NeXT's challenge has been to define a set of core objects that can handle fundamental tasks but that are also flexible enough to be extended and reused.

"You can't anticipate every use, so you have to be careful to define objects that are very flexible. You become an expert at developing objects by doing it," says Hegarty. "Apple [engineers] will become experts in three to four years, and in three to four years, we'll have even better objects."

NeXT will continue to sell its system to what it has identified as its market: customers with specialized needs that cannot be addressed by off-the-shelf software. "We build leveraged software, software that others can use to build their own software really quickly," says Tevanian.

It's for that reason that customers such as UBS Securities, a New York-based subsidiary of the United Bank of Switzerland, and First National Bank of Chicago have adopted NeXT for in-house development of proprietary trading systems.

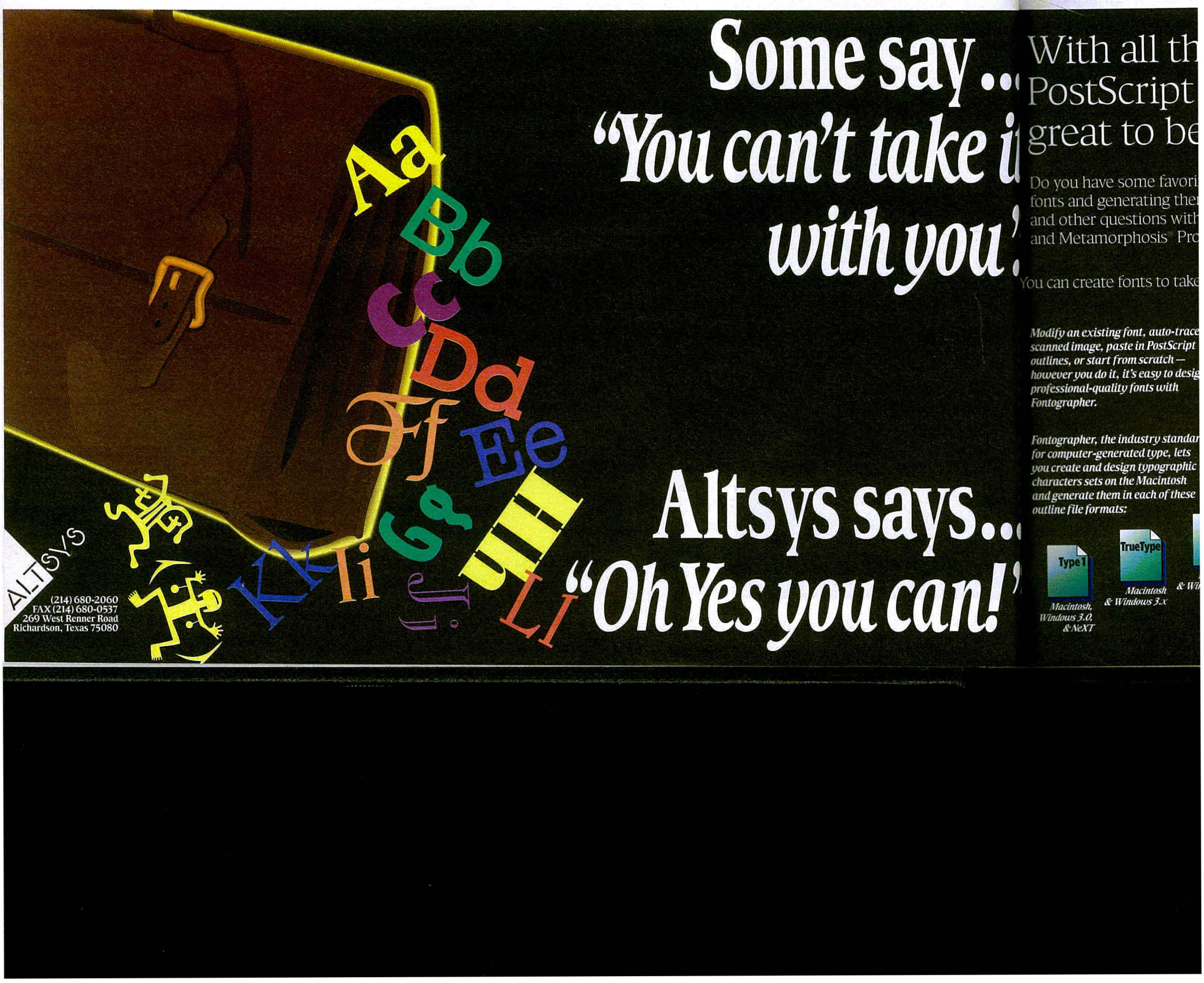
"Working in an object-oriented environment is dramatically better than programming in Old World–style stuff. The most obvious is code reusability, when you take the generic building block approach to building software," says Hadar Pedhazur, UBS vice president and equities technology manager. "NeXT is the richest environment for actually seeing things that were done in an object-oriented sense. The Application Kit allows programmers who are totally alien to the concept of object-oriented programming to get up to speed rather quickly. Development time is amazing. Starting from scratch, from being shipped the machine to actually trading dollars with the system, it took three months, with a three-person team, to develop our system."

First National Bank of Chicago settled on NeXT in part because of its sophisticated graphical user interface, according to Georges Cortedon, vice president and head of quantitative research for the bank, which has about 130 NeXT workstations.

"The graphical user interface of NeXT is far superior to any interface available on any other workstation right now," he says. "What we have to do is put trading systems. Those syst a graphical user interface ir ing screens and building pr It's important for us to buil prototypes quickly."

For Goulde of Open S Advisors, NeXT has at lea important advantage: It's a now. "[Most customers] c really care less about whet operating system is object- or taffy-oriented," Goulde "What they care about is t ware environment that's b on top of it. NeXT clearly advantage because it has s years refining its system."

CONNIE GUGLIEL *is a San Francisco–based writer.*



SIMSON00000886

UBS vice president and
echnology manager.
s the richest environment
ly seeing things that were
n object-oriented sense.
ication Kit allows program-
are totally alien to the
f object-oriented program-
et up to speed rather
Development time is amaz-
ing from scratch, from
oped the machine to actu-
g dollars with the system,
ree months, with a three-
am, to develop our system."
National Bank of Chicago
NeXT in part because
histicated graphical user
according to Georges
, vice president and head
tative research for the
hich has about 130 NeXT
ions.
graphical user interface
is far superior to any
available on any other
ion right now," he says.

"What we have to do is put together trading systems. Those systems use a graphical user interface in designing screens and building prototypes. It's important for us to build those prototypes quickly."

For Goulde of Open Systems Advisors, NeXT has at least one important advantage: It's available now. "[Most customers] couldn't really care less about whether an operating system is object-oriented or taffy-oriented," Goulde says. "What they care about is the software environment that's built on top of it. NeXT clearly has an advantage because it has spent years refining its system."

CONNIE GUGLIELMO
is a San Francisco–based free-lance writer.

INTERFACE BUILDER: ICING ON THE CAKE

WHEN MOST PEOPLE THINK OF PROGRAMMING IN NEXTSTEP, THEY THINK OF INTERFACE BUILDER, NEXT'S REVOLUTIONARY PROGRAM FOR BUILDING GRAPHICAL USER INTERFACES AND CONNECTING TOGETHER OBJECT-ORIENTED CODE.

INTERFACE BUILDER LETS A PROGRAMMER LITERALLY DRAW THE INTERFACE THAT THEY WANT THEIR PROGRAM TO HAVE. WINDOWS, TEXT FIELDS, SLIDERS, BUTTONS, AND MORE ARE ALL ON PALETTES, READY TO BE DRAGGED OFF AND RESIZED LIKE SOME KIND OF HIGH-TECH DRAFTING PROGRAM.

"WHEN WE GO TO CLIENTS, WE USE IT RIGHT IN FRONT OF THEIR FACES," SAYS ADAMATION'S WILLIAM ADAMS, WHOSE FIRM DOES A LOT OF CUSTOM PROGRAMMING FOR LARGER COMPANIES. "WE HAVE THEM ACTUALLY SIGN OFF ON THE SCREENS."

BUT INTERFACE BUILDER DOESN'T JUST DRAW THE INTERFACE – IT ACTUALLY CONSTRUCTS THE OBJECTIVE C OBJECTS THAT THE APPLICATION PROGRAM WILL USE AND SAVES THEM INTO A NIB (NEXT INTERFACE BUILDER) FILE. WHEN THE PROGRAM RUNS, IT LOADS THOSE SAME OBJECTS OUT OF THE FILE AND INTO THE COMPUTER'S MEMORY.

"YOU'RE NOT JUST PROTOTYPING," SAYS ADAMS. "YOU'RE ACTUALLY DEVELOPING WHAT YOU NEED TO DEVELOP."

INTERFACE BUILDER MAKES INTERNATIONALIZATION A SNAP – DEVELOPERS SIMPLY TAKE THEIR NIB FILES AND GIVE THEM TO PROFESSIONAL TRANSLATORS. THE TRANSLATORS CLICK ON EACH ENGLISH PHRASE WITH THE MOUSE AND TYPE IN THE CORRESPONDING GERMAN (OR FRENCH OR SPANISH) WORD. IF THE NEW WORD IS TOO BIG, THE NEXT'S TEXT FIELDS, MENUS, AND BUTTONS AUTOMATICALLY ACCOMMODATE IT BY MAKING THEMSELVES BIGGER.

BUT THE REAL BOON OF INTERFACE BUILDER COMES WHEN CHANGES HAVE TO BE MADE. IT'S EASY TO ADD MORE BUTTONS, MOVE FIELDS AROUND, OR EVEN ADD WHOLE NEW WINDOWS AND PANELS TO EXISTING APPLICATIONS. THAT'S SOMETHING THAT NO MERE PROTOTYPING TOOL CAN DO.

THE REASON? INTERFACE BUILDER WORKS INTIMATELY WITH BOTH OBJECTIVE C AND THE APP KIT. WITHOUT OBJECTIVE C'S RUN-TIME BINDING, IT WOULDN'T BE POSSIBLE TO SIMPLY DRAW AN APPLICATION'S INTERFACE AND HAVE IT WORK, BECAUSE THE APPLICATION PROGRAM WOULD HAVE TO BE COMPILED WITH THE LOCATION AND TYPE OF EVERY WIDGET IN THE PROGRAM'S WINDOWS.

say...
take it
h you!"
says...
u can!"

With all that you have invested in your PostScript and TrueType fonts, wouldn't it be great to be able to take them to your NeXT?

Do you have some favorite fonts that are available only on the Macintosh? How about modifying these fonts and generating them in NeXT® Type 1 PostScript® language format? Altsys provides the answers to these and other questions with Fontographer,® the industry standard for computer-generated type on the Macintosh, and Metamorphosis® Professional, the complete font conversion utility.

Coming Soon

Opening doors t
your creativity

ALTSYS
VIRTUOSO

The advanced drawin
design & productio
program for the NeX
professional workstatio

You can create fonts to take with you using Fontographer...

Modify an existing font, auto-trace a scanned image, paste in PostScript outlines, or start from scratch — however you do it, it's easy to design professional-quality fonts with Fontographer.

Fontographer, the industry standard for computer-generated type, lets you create and design typographic characters sets on the Macintosh and generate them in each of these outline file formats:

Type 1 — *Macintosh, Windows 3.0, & NeXT*
TrueType — *Macintosh & Windows 3.x*
Type 3 — *Macintosh & Windows 3.0*
EPS — *Adobe Illustrator 1.1*

1·9·9·1 Publish READERS' CHOICE

... or convert fonts with Metamorphosis Professional.

Convert your favorite Macintosh fonts for use on your NeXT with Meta Pro. No other software utility gives you this capability.

Meta Pro also gives you the power to convert your TrueType, Type 1, and Type 3 Apple® Macintosh® fonts into each of these outline file formats:

Type 1 — *Macintosh, Windows 3.0, & NeXT*
TrueType — *Macintosh & Windows 3.x*
Type 3 — *Macintosh & Windows 3.0*
EPS — *Adobe Illustrator 1.1*
PICT — *Macintosh*

Circle 22 on reader service card

For more information about these products, plea
complete and return the attached reply ca



FOR A JUMP START IN THE CONCEPTS OF NEXTSTEP, THERE IS NOTHING LIKE A WEEK AT NEXT DEVELOPER CAMP

BY SIMSON L. GARFINKEL

MONDAY

"Hi, this is NeXT Developer Camp, and you're going to be here for the next four-and-a-half days."

A tall man with long blond hair in a ponytail stands in the front of the room. "My name is Randy Nelson. I'm the lead developer trainer here at NeXT. We're specifically charged with getting developers jump started in this environment."

Although it really is faster and easier to develop an application on a NeXT than on a Macintosh or a Sun workstation, NeXTstep is so fundamentally different from other graphical user interfaces that most programmers flounder when they get their first exposure to it. They simply don't know what to do.

The second problem with learning to program the NeXT is the size and complexity of the system. There's not one, but two new languages that need to be learned: Objective C and Display PostScript. Then there's Interface Builder, an application program for putting together other application programs. Interface Builder is easy to use, but you've got to learn how, and for three years there hasn't been any documentation.

Hence Camp, designed to get developers over that initial hump in the learning curve. "We are not going to go into any one topic in great detail," Nelson explains. "The general intent of this class is a fast start, so we are going to work on skills, rather than reference-level learning."

We won't learn enough about NeXTstep in a week to teach the class, but we should be able to write a simple application and wade through the documentation to learn what we don't know.

The first Developer Camp was taught in March 1988, seven months before the original NeXTcube was announced. Fewer than a dozen programmers were there, emissaries from the first key companies to develop programs for the NeXT (as well as a few from firms that didn't). According to Jeanne Etcheverry, NeXT's director of developer training, more than 1500 students have gone through the camp, which is now open to anybody who can afford the $1500 tuition and a week at a hotel. The class, whose correct title is "Programming NeXT Computers," has three full-time instructors: Nelson, Susan Rayl, and Tom Affinito, and is taught in Redwood City, California (across the street from NeXT's corporate headquarters), and Pittsburgh, Pennsylvania.

In special cases, NeXT also offers on-site classes. When Lotus got

religion about the NeXT
employees at NeXT, spe
to speed on the new plat
for Wall Street traders ar
in Europe, Japan, and A

"For a while, we tri
here at NeXT. It was co
a military boot camp. Bu
with our customers," Et

After the brief introducti
the Redwood City classr
It's immediately apparen
26 campers – some have
NeXT, while others have

At one end of the sp
young turks from Talus
come to camp "because
take this class first." (It's
Camp is a necessary intr
and it can't be taught ov
has already written a sig
ing system that displays
to a Polaroid printer.

At the other end of
white-haired artist from
Canada. Berteig wants t
server, and a NeXTdime
contracted to develop a
installation in Greenland
experience, but he's eage

Another oddball at
Kendall Square Researcl
says that Kendall Square
computer, much faster th
company got interested i
The idea was to use the
video to bring interactiv
desktop. When I point o
real-time compressed vic
C-Cube Microsystems, h
has other reasons for bei

Before lunch we're build
vert from degrees Celsiu

SIMSON00000888

68800000NOSWIS

D A Y

amp, and you're going to
four-and-a-half days."
th long blond hair in
in the front of the room.
ıdy Nelson. I'm the lead
here at NeXT. We're
ed with getting developers
environment."
ılly is faster and easier to
ıtion on a NeXT than on a
ın workstation, NeXTstep
y different from other
faces that most program-
ey get their first exposure
t know what to do.
ım with learning to pro-
size and complexity
not one, but two new lan-
and Display PostScript.
program for putting
e Builder is easy to use,
ars there hasn't been any

over that initial hump in
nto any one topic in great
of this class is a fast start,
ı reference-level learning."
in a week to teach the
application and wade
don't know.

ch 1988, seven months
l. Fewer than a dozen
first key companies to
few from firms that
I's director of developer
hrough the camp, which
1500 tuition and a week
ogramming NeXT Com-
, Susan Rayl, and Tom
ornia (across the street
ttsburgh, Pennsylvania.
classes. When Lotus got

religion about the NeXT, Bruce Blumburg, one of the core original employees at NeXT, spent a week bringing the Improv developers up to speed on the new platform. NeXT has also done on-site classes for Wall Street traders and the federal government, as well as classes in Europe, Japan, and Australia.

"For a while, we tried to eliminate the term 'Developer Camp' here at NeXT. It was considered too cute or to have connotations like a military boot camp. But the name has stuck, both internally and with our customers," Etcheverry says.

After the brief introduction, Nelson spends half an hour going around the Redwood City classroom, having people introduce themselves. It's immediately apparent that skill levels vary widely among the 26 campers – some have had a lot of experience programming the NeXT, while others have had almost none.

At one end of the spectrum is Andrew Lowenstern, one of the young turks from Talus Corporation in Houston, who says that he's come to camp "because nobody at NeXT will talk to you unless you take this class first." (It's true: The information taught at Developer Camp is a necessary introduction to programming with NeXTstep, and it can't be taught over the phone.) The 18-year-old Lowenstern has already written a significant NeXTstep program: an image printing system that displays a TIFF or EPS file on the screen, then sends it to a Polaroid printer.

At the other end of the spectrum are people like Gary Berteig, a white-haired artist from Keyano College in Fort McMurray, Alberta, Canada. Berteig wants to use his network of nine workstations, a server, and a NeXTdimension to teach visual arts. He's also been contracted to develop a video using the NeXTdimension for an installation in Greenland. Berteig's had virtually no programming experience, but he's eager to learn.

Another oddball at Developer Camp is Bill Southworth, from Kendall Square Research in Waltham, Massachusetts. Southworth says that Kendall Square is developing a revolutionary new supercomputer, much faster than a Cray or a Connection Machine. The company got interested in NeXT because of the NeXTdimension: The idea was to use the NeXTdimension's ability for compressing video to bring interactive animation from the supercomputer to the desktop. When I point out that the NeXTdimension doesn't have real-time compressed video because of a problem with the chip from C-Cube Microsystems, he just smiles and says that Kendall Square has other reasons for being interested in NeXT.

Before lunch we're building our first application, a program to convert from degrees Celsius to degrees Fahrenheit.

First we draw the application's interface: a text field for the input, another for output, a few titles, and a button to perform the conversion operation. Immediately we see the power of Interface Builder. We don't have to calculate the size in pixels of the window or the controls inside it to design the interface – we just draw it. We don't need to edit C code and look up functions from a manual to make titles appear – we just drag them from the palette and double-click them to change their text. It's more like using Adobe Illustrator than writing a computer program.

The next step is to build a new kind of tool, a special "object" that knows how to convert from one temperature scale to another. The object implements a single "message": a command for it to read the contents of one cell, multiply it by 9, divide it by 5, add 32, and put the result into the Fahrenheit cell. Under Nelson's instruction, we write the Converter object and connect it up to the interface that we've already created. Then we test it. The application works the first time.

After lunch we get a two-hour lecture about the wonders of object-oriented programming. It's not that foreign; after all, we've already built an object.

Solving a problem with object-oriented programming involves first designing a set of objects, each tailored to represent part of the problem and perform a specific set of operations.

For example, explains Nelson, suppose you wanted to design an air traffic control simulation. The program will need objects for airplanes, runways, baggage carriers, baggage, and other physical elements. Some objects can move, while others cannot. Then there are the more abstract objects, like flight plans and weather.

The next step is to figure out relationships between the different kinds of objects and put them into a hierarchy. Helicopters are like airplanes, except they fly a little differently. Runways, buildings, and parking lots are all similar in that they occupy a set position in space that doesn't change.

Finally, the programmer has to figure out what sort of action each object needs to support, and what sort of information it needs to remember in order to furnish that support. Information inside the airplane object might include its position, its velocity, whether or not its landing gear is extended, and the amount of fuel left in its tank.

This whole process is called "object decomposition." It's often the hardest part of writing a large object-oriented system. "If you do this a long time, you might get a little good at it," says Nelson, but the best way to do object decomposition is to sit down with a person who knows the field backward and forward – a domain expert – and do it with him or her.

In other words, if you want to write an air traffic simulator, get yourself an air traffic controller and ask how it's done.

Illustration by Daniel Pelavin

TUESDAY

Class starts at 9 a.m., but most of the students show up early, both to get at the machines and to get the continental breakfast that NeXT has laid out – pastries, muffins, fruit, coffee, and juice. My favorite is the pineapple; it's fresh.

Nelson starts the class with a detailed description of Objective C, the object-oriented language used by the NeXT.

NeXT has taken a lot of flack for choosing Objective C instead of C++, another object-oriented language that seems to be all the rage in the outside world. C++, says Nelson, was designed to make it easy for small groups of programmers, six or seven at most, to share code. Objective C was designed with a much grander objective: to enable companies to bundle pieces of programs together as software integrated circuits, buying and selling software modules as needed to get the job done.

But C++ was invented by AT&T, the makers of UNIX, and AT&T's backing has gained it institutional foothold. There are now many C++ compilers. Objective C, meanwhile, is a proprietary language owned by a small Massachusetts company, Stepstone Corporation. Aside from NeXT, the world has overwhelmingly chosen to adopt C++ as the object-oriented programming language of choice.

It's clear that Nelson has heard a lot of complaints about Objective C vs. C++ before. "Look, we're not interested in religious arguments," Nelson says to questions. "Write your program in BASIC if you want. We just want you to write the best software you can."

The reason NeXT chose Objective C, says Nelson, was that NeXT couldn't have written Interface Builder without it.

That afternoon Nelson gives us a tour of NeXTstep, the NeXT's window system and program-development environment.

"NeXTstep is a legal creation," explains Nelson. Simply put, NeXTstep is "everything that we licensed to IBM." It includes Interface Builder, the Application Kit, the Workspace Manager, and the Window Server.

Nelson focuses on the Window Server, the master control program that runs the system. The Window Server constantly monitors the mouse and keyboard and sends events to the appropriate application. It's the NeXT's Window Server, running on top of the Mach operating system, that makes the NeXT able to run more than one program at a time. Together they make it much harder for one misbehaved program to crash the entire computer.

Tuesday night we have the first of three labs: building a calculator. We are given two versions of the program, one that is finished and working, and one that isn't. The idea is to figure out how they are different and write the code necessary to make the second program work. It gets us to understand how basic parts of the NeXT environment work.

WEDNESDAY

We start out Wednesday by taking a giant step backwards – trying to write a NeXTstep application without using Interface Builder. "It is possible," Nelson assures us. You simply have to specify, by hand and with Objective C, everything you get for free with Interface Builder.

It can be done, but by the end of the morning we see the price of this bullheadedness. Without Interface Builder, our simple program that had taken less than 40 lines of code balloons to over 280.

But Interface Builder's real payoff doesn't come when you develop the first version of the program; it's when you go back to develop the second or third. Interface Builder makes it a snap to change or add things that would require hours with conventional programming methods.

Nelson tells us that developers report that Interface Builder gives them an "acceleration factor" of between 3 and 10 – meaning it's 3 to 10 times faster to develop a program on the NeXT than on a Sun, on a Macintosh, or under Microsoft Windows. Indeed, it's so much faster that a lot of companies have started developing their proof-of-concept program on the NeXT and then porting it to the Macintosh or Windows for the final version.

That certainly might explain why two programmers from Aldus are taking the course. The whole week they've been very vague and secretive about why they are present, except to say that "Aldus wants to keep current with all desktop technologies." It's clear from some of their questions that they're working on something big for release some time within the next year. But they're also interested in how to take something developed on the NeXT and port it to another platform.

After lunch, Nelson starts explaining the nuts and bolts of the Application Kit – the basic set of objects from which all NeXTstep applications are built.

First there is the Application object, which basically manages the connection between the application program and the Window Server. The Application object receives events and messages from the rest of the computer and sends them to other parts of the running program. It's an event distributor.

The second key object is called Window, which, as the name implies, manages the windows that an application puts on the screen. To draw anything on the NeXT's screen, you've got to create a Display PostScript window, which usually involves creating a Window

object to go along with it.
basic Window operations,

But the most ingeniou
object, which handles the
a method called **drawSelf:**
code that makes them dra
another message and the I
In a word, this is why it's
and why everything on th
sent to the printer – it's no
it's generated by the same

Wednesday evening's
"Cracker Barrel." For din
mer food: Rub it on the k
jokes Nelson. More than
tables that have signs read
"Software Engineering,"

After dinner we work
ing Lab. Compositing lets
the compositing operator
should be blended. Nelso
and broken it – deleted th
code, and changed others.
keeps us going until the la

TH

Thursday's class is a little
done the Compositing La
compositing and graphics

The schedule mix-up
the need to accommodate
NeXT's resident graphics
an after-hours NeXTdim
NeXT's demo room and
surfer with curly hair, sitt
that's playing the final se

Once we are all in th
Builder and builds a min
special kind of View that
dimension).

Here's what Ohlfs d
and fills it with an NXL
two buttons: one sends t
message. Finally Ohlfs te
When the buttons are pr
matically starts and stops

SIMSON00000890

SIMSON0000891

o make the second pro-
asic parts of the NeXT

D A Y

step backwards – trying to
g Interface Builder. "It is
ave to specify, by hand and
ee with Interface Builder.
iorning we see the price
uilder, our simple program
illoons to over 280.
n't come when you develop
you go back to develop
s it a snap to change or
onventional programming

hat Interface Builder
veen 3 and 10 – meaning
m on the NeXT than on
: Windows. Indeed, it's
e started developing their
id then porting it to the
n.
rogrammers from Aldus
ve been very vague and
to say that "Aldus wants
s." It's clear from some of
ething big for release some-
terested in how to take
: it to another platform.

ts and bolts of the Applica-
all NeXTstep applications

ich basically manages
gram and the Window
its and messages from the
er parts of the running

w, which, as the name
ication puts on the screen.
ou've got to create a
volves creating a Window

object to go along with it. The Window object controls all of the basic Window operations, like resizing, miniaturization, and closing.

But the most ingenious part of the Application Kit is the View object, which handles the actual drawing. All View objects have a method called **drawSelf:**, which causes them to generate PostScript code that makes them draw themselves on the screen. Send the View another message and the PostScript code gets redirected to the printer. In a word, this is why it's so easy to make NeXT applications print, and why everything on the screen looks exactly the way it does when sent to the printer – it's not just drawn with the same PostScript code, it's generated by the same View.

Wednesday evening's Developer Camp dinner is called the "Cracker Barrel." For dinner we have pizza and beer. "Real programmer food: Rub it on the keyboard and the machine will run faster," jokes Nelson. More than a dozen people from NeXT sit down at tables that have signs reading "Developer Partnerships," "Training," "Software Engineering," and "Third-Party Marketing."

After dinner we work on our second lab exercise, the Compositing Lab. Compositing lets you combine two images to create a third; the compositing operator allows you to specify how the two images should be blended. Nelson has taken the running Compositing Lab and broken it – deleted the user interface, removed some pieces of code, and changed others. We have to make it work again. The project keeps us going until the lab is locked up around us at 9 p.m.

T H U R S D A Y

Thursday's class is a little like a time warp. It turns out that we had done the Compositing Lab a day early: Thursday's lecture is about compositing and graphics on the NeXT.

The schedule mix-up was a bit of an oversight, due partly to the need to accommodate Keith Ohlfs's schedule that week. Ohlfs, NeXT's resident graphics genius, conducts Thursday's high point, an after-hours NeXTdimension demo across the street. We walk into NeXT's demo room and see Ohlfs, who looks like a 26-year-old surfer with curly hair, sitting in front of a NeXTdimension display that's playing the final sequence from *Star Wars* in a window.

Once we are all in the room, Ohlfs fires up a copy of Interface Builder and builds a miniature NeXT-TV application using a special kind of View that handles live video (but only on the NeXTdimension).

Here's what Ohlfs does, in 53 words: He creates a window and fills it with an NXLiveVideoView object. Then he puts down two buttons: one sends the View a **start:** message, the other a **stop:** message. Finally Ohlfs tells Interface Builder to test the interface. When the buttons are pressed, the NXLiveVideoView object automatically starts and stops the attached videodisc player.

When we get back to the classroom, it's 8 p.m. Some of the campers stay to work on their pet projects, but most go back to their hotels.

F R I D A Y

The last day of camp flies by. The night before, Nelson had put together a simple text editor that could load and save files, print them, and handle multiple windows. He spends the morning showing us how it all works.

The purpose, says Nelson, is so that we could go home and build a multifont text editor for our bosses to show that we had learned something. While he's showing us the program's construction on the light valve, he realizes that the text editor doesn't handle text with different colors. "No problem!" he says.

While we watch, Nelson drags a Colors menu cell from the Interface Builder palette into his application. The object is already connected up to the rest of the application through the insides of the NeXTstep Application Kit – details with which few programmers ever need concern themselves. Nelson simply recompiles his program and shows how it lets him now change the color of text.

"There: I did it in ten minutes. Microsoft's had two years to do it with Word and they still haven't."

The real value of the morning's class is seeing how all of the little things we've learned finally get put together in a significant program. And seeing how easy that program is to expand, once the proper foundation is laid.

Friday's class ends around noon. Nelson has two big boxes of floppy disks at the front of the room and hands them out to each student, so we can take home the example program and the work we've finished during the week. Then we fill out evaluations. Camp ends with a tour of NeXT's state-of-the-art factory, and we're on our way home.

As we wave goodbye to the friends we've met there, I think, all right, so the curriculum could be better served by good tutorial documentation. Until that's available, and while the community is still small enough to get the one-on-one training, camp is a fantastic way to jump into NeXTstep programming.

SIMSON L. GARFINKEL *is a senior editor at NeXTWORLD magazine.*

Database.

If you've been waiting for a real database—one that's powerful enough for corporate MIS, yet intuitive enough for end users—we have something to show you.

Parabase!

With Parabase™, you can create custom multi-user database applications in a matter of hours, not months.

Power? Reliability? Security? Yes, yes and yes.
Because Parabase is based on the Sybase SQL Server.

Advanced? Yes. With Parabase, even storing documents and images in the database is as easy as drag-n-drop.

Want to find out more?
Call 310-394-1820 to receive a fact-filled Parabase brochure.
And by next week you could be rolling out that mission critical database application you've been envisioning for so long.



PARABASE

The new database standard

See us at NeXTWORLD EXPO, January 22-23, 1992, Brooks Hall/Civic Auditorium, San Francisco, booth 219.

Parabase is a trademark of IP Design Inc., NeXT is a trademark of NeXT, Inc., Sybase and SQL Server are trademarks of Sybase, Inc.
IP Design Inc. 201 Wilshire Blvd. Ste A-3, Santa Monica, CA 90401 (310) 394-1820. You may also send your request for literature via e-mail to parabase_info@ipdesign.com.

Circle 28 on reader service card

G

Space getting tig
for buildin

Your cozy NeXT sys
you installed it. But
feels a little too coz
other files has expa
and cranny on you
disk. The time has c
adding on more stora
PC lovers may sco
hear that a 200MB h
too small for a Ne
reality is that soon
(probably sooner)
files will fill it. Fortu
new technologie
shrinking prices ar
ing huge hard dis
tractive to NeXT
Storage costs are p
toward the dolla
megabyte level. I
1.2GB drives, wh
above $3000 last
pushing $2000.
ress brings other h
capacity hard drive
100MB or 400MB
the newest gigaby
inch mechanism,
hardy constructior
Not everyone is lo

ILLUSTRATIONS BY CATHERINE KAN

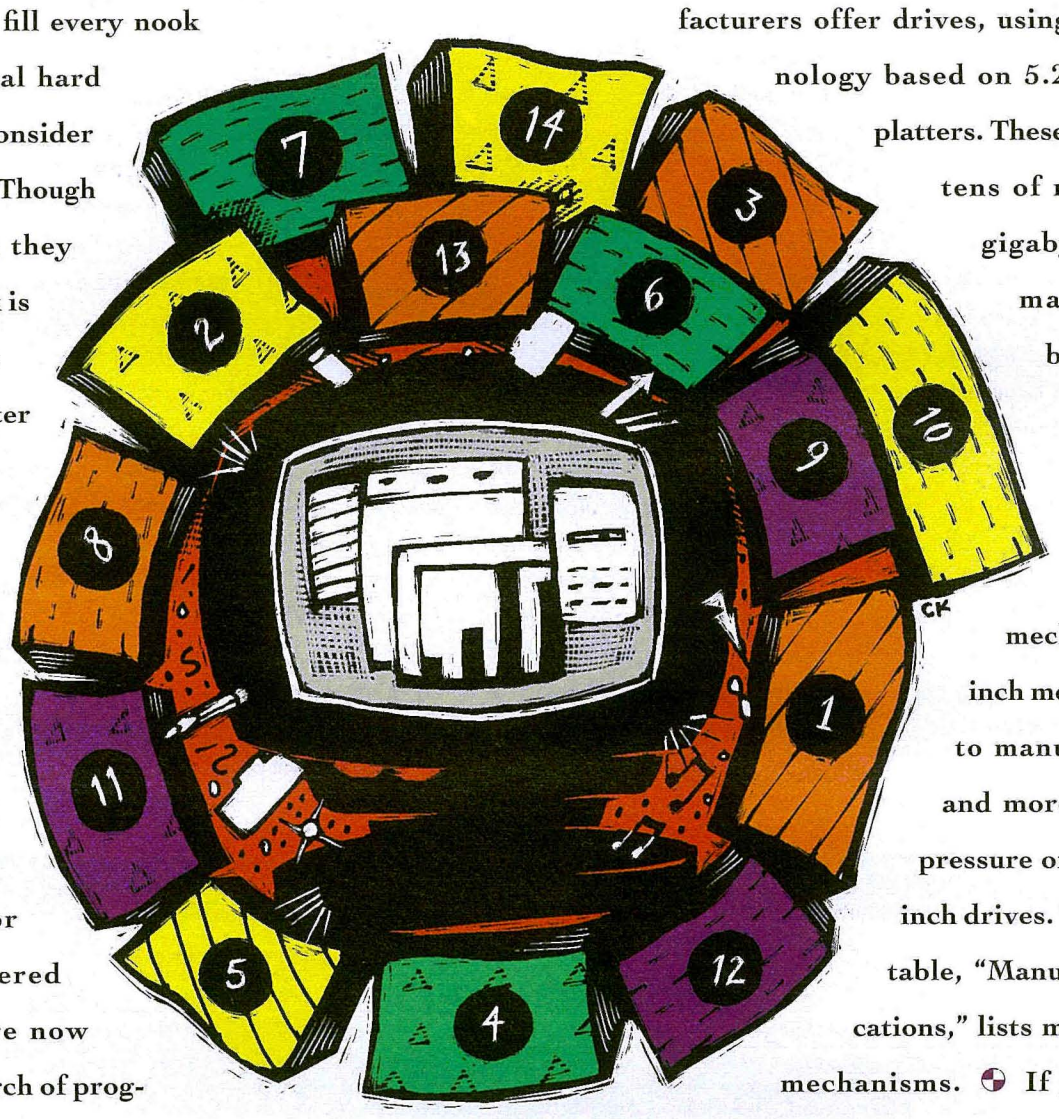
SIMSON00000892

SIMSON00000893

Gigabyte Appetite

Space getting tight? Here are 14 storage options for building on to your NeXT system.

Your cozy NeXT system seemed to have ample storage the day you installed it. But, now, just a few months later, it probably feels a little too cozy. Your collection of images, sounds, and other files has expanded to fill every nook and cranny on your internal hard disk. The time has come to consider adding on more storage. ◔ Though PC lovers may scoff when they hear that a 200MB hard disk is too small for a NeXT, the reality is that sooner or later (probably sooner), your files will fill it. Fortunately, new technologies and shrinking prices are making huge hard disks attractive to NeXT users. Storage costs are plunging toward the dollar-per-megabyte level. Prices for 1.2GB drives, which hovered above $3000 last year, are now pushing $2000. ◔ The march of progress brings other benefits. Until recently, no high-capacity hard drive could match the NeXTstation's internal 100MB or 400MB drive for speed, silence, or reliability. Now, the newest gigabyte-sized external drives use a similar 3.5-inch mechanism, offering top performance, low noise, and hardy construction in a small case. An attic or a second home? Not everyone is looking for the comfort of an extra gigabyte of storage space. Before you begin shopping for hard drives, consider your needs. If you've purchased an economy-model NeXT with an internal 105MB drive, you may simply desire an add-on 330MB drive to access the entire NeXTstep extended operating system. If you opt to go for the big iron, you'll find a choice of several 1.2GB drives for around $2000. All manufacturers offer drives, using well-worn technology based on 5.25-inch magnetic platters. These drives range from tens of megabytes to the gigabyte range. A few manufacturers are beginning to offer drives that use a new technology that packs data onto 3.5-inch mechanisms. The 3.5-inch mechanism is cheaper to manufacture, quieter, and more reliable, putting pressure on the sales of 5.25-inch drives. The accompanying table, "Manufacturers' Specifications," lists many popular drive mechanisms. ◔ If you're more concerned with backup of your existing files, a gigabyte-sized hard drive might not be the best buy. Tape drives offer the option of backing up an entire hard disk on a low-cost 1.2GB or 5GB magnetic tape. Removable drive devices that use SyQuest, Ricoh, or Bernoulli media allow file storage in 44MB or 88MB chunks. (See the sidebar, "You Can Take It With You," for our review of removable drives.)



By Daniel Miles Kehoe

Illustrations by Catherine Kanner

cisco, booth 219.
c.
e_info@ipdesign.com.

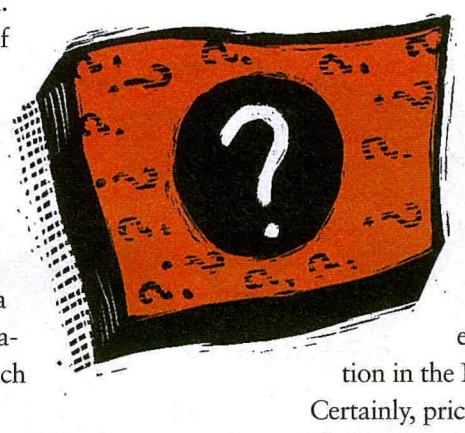
Experience the pleasure of computing with elbow room

Like the Macintosh, NeXT can use just about any hard disk with a SCSI interface. But a drive designed for a Mac won't deliver ultimate satisfaction to a NeXT user. At the factory, drive mechanisms may be shipped with cache systems disabled and low-level formatting suitable for slower systems. If you want to buy from a low-priced vendor that advertises in the back of a Macintosh magazine, ask for a drive tweaked for UNIX machines – and be prepared to research how to set parameters for low-level formatting.

A handful of vendors sell drives designed for use with the NeXT. Of course, they come in black cases. Some vendors further tweak the drives for optimum NeXT performance. Typically, a NeXT vendor makes sure caching is turned on and interleaving is set at 1:1. One vendor, The Cube Route, will eliminate unneeded spare sectors and switch drive formatting from 512 bytes/sector to 1024 bytes/sector, optionally customizing your disk for improved speed or capacity.

Choosing the right drive

NeXTWORLD evaluated a sampling of NeXT-specific drives (see the table, "*NeXTWORLD* Drive Test Results"). Though many of the drives in our table may not be your best buy at the time you read this article, our performance measurements provide a starting point for comparison. Specifications of average seek time (in milliseconds) and data transfer rate (in megabytes/second) will give you a sense of the relative speed of each mechanism.



Before you call for drive prices, take time to grasp the dynamics of the market. The storage business is intensely competitive; it seems that each month a new manufacturer cuts prices and shakes up the market. Price cuts are passed on by distributors to vendors, who need to place large orders regularly, playing suppliers off each other. Since you may need to rely on your drive manufacturer for after-sale service and support, you'll want to be soothed by a vendor who knows the NeXT, can expedite repairs, and will be around to handle warranty claims a year from now.

Brand name suppliers like Microtech International, MicroNet Technology, and PLI have long track records on other platforms. Other NeXT-specific manufacturers are working to establish a reputation in the NeXT market.

Certainly, pricing won't correspond with the relative merits of each drive. Shop around. Ask what the best drive is for your money, never forgetting that a vendor may tell you that the best drive is the one they got the best buy on last week.

One factor may weigh heavily in your decision: Since an external drive must take up residence near your NeXT, you'll want a drive that is quiet. The enclosure's fan noise may be more important than the sound the mechanism makes when it seeks for data. *NeXTWORLD* measured loudness with a decibel meter 1 foot from the front of the drives' enclosures. Drives from Tecor and Microtech were particularly quiet.

It is also worthwhile to consider the "extras" offered by various vendors to entice the purchaser. The Tecor drive includes 20MB of public domain software rounded up by the Bay Area NeXT Group, for example. The Cube Route's drives include a nifty auto-power feature that makes it unnecessary to turn off the drive when you turn off your computer – the drive shuts down automatically. Liberty Systems offers a drive that is small enough to carry in a book bag. The list goes on and on. Only you will know the real value of any feature.

Which vendor did *NeXTWORLD* like best? Tecor offers a wide selection of drives and demonstrated NeXT expertise, but one of its drives arrived with a loose inter

NeXTWORLD drive test results

			Category	Model No.	Raw Capacity (MB)	Average Seek (ms)	Tested Transfer Rate (ms)	Measured Fan Noise (db)	US Price	Cost per Megabyte[1]
NeXTstation		Quantum Internal	200MB	PD2105	199	19.94	1.31	50	n/a	n/a
External drives	Tecor	Seagate Wren 8	1.6GB	ST41650NM	1350	21.51	1.68	55	$2385	$1.77
		Fujitsu	525MB	M2624S	496	14.57	1.40	55	$1485	$2.99
	The Cube Route	Seagate Wren 6	660MB	ST4766N	645	21.99	1.54	57	$1895	$2.94
	PLI	Seagate Wren 6	660MB	ST4766N	633	22.63	1.46	58	$2099	$3.32
		Seagate Wren Runner 2	660MB	ST4767N	635	16.62	1.45	56	$3079	$4.85
	Park Systems	Maxtor	1.6GB	P1-17S	1523	18.43	1.98	60	$3311	$2.17
		Fujitsu	525MB	M2624S	522	13.80	1.43	59	$1735	$3.33
	Liberty Systems	Quantum Portable	425MB	PD4255	407	17.26	1.23	55	$2299	$5.65
	MicroNet	Seagate Wren Runner 2	660MB	ST4767N	635	16.46	1.45	59	$4399	$6.93
	Microtech	Seagate Wren 8	1.6GB	ST41650NM	1350	21.56	1.68	55	$3400	$2.52
Removable cartridge drives	Microtech	Ricoh	50MB	R50	46	13.60	0.23	57	$999*	n/a
	Iomega	Bernoulli	90MB	BETA 90	86	39.76	0.28	60	$838*	n/a
	MicroNet	Syquest	88MB	SQ5110	85	12.47	0.23	58	$849*	n/a

[1] Cost per Megabyte = US Price / Raw Capacity (MB)

*Price of removable drive unit plus one cartridge.

Living w

The original NeXTcub storage. What was adv carry around and use t we got was the NeXT's worst, thanks to a prob factorily solve. So inste people used them strictl from place to place.

Of course, this le problem that the optic having all of your data vice-versa. Maintainin keeping everything in s

With the appeara grammers in NeXT's so solving the problem a NeXT's MegaPixel Di NeXTstation itself doe so-called "laptops." Se and another at home a ends.

If lugging around perhaps you should co below. Each has its ow high-speed access to al in the process.

Give me liberty

The Liberty drive is a 425MB, 3.5-inch Qua NeXTstations). A 525 sure is a power supply comes with a trendy l

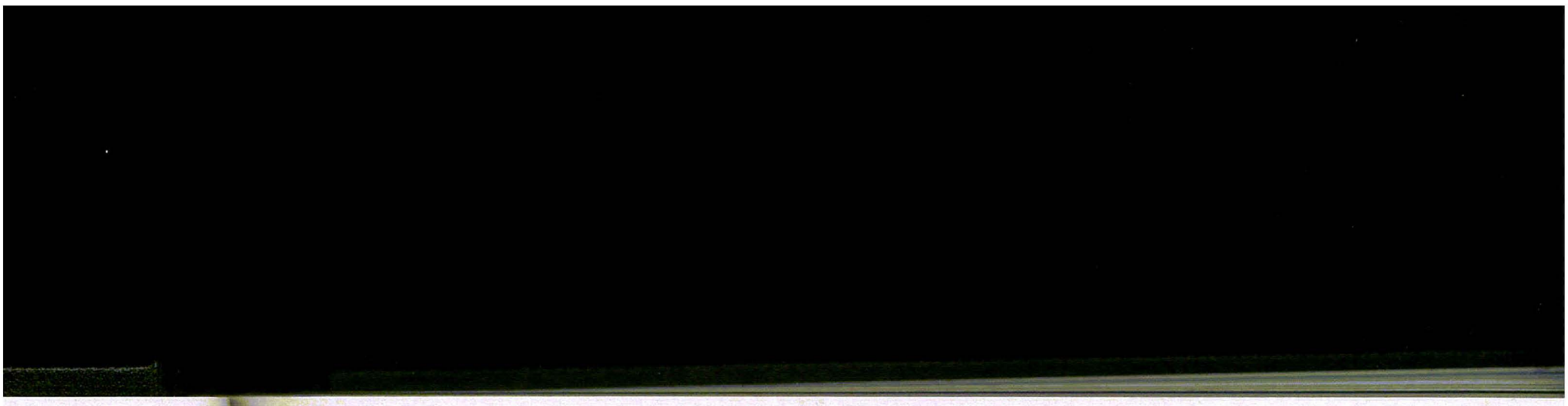
The best way to u operating system on it it as your main system home to work.

Significantly large time you read this. Ju

nal connector. The Cub two unexceptional driv nisms when we checke established reputation a Park Systems Technolo one piece of unreliable (NeXT '040 computers tially support SCSI-2) b an undeniable enthusia

SIMSON00000894

SIMSON00000896



bow room

XT, you'll want a drive that
The enclosure's fan noise
more important than the
ne mechanism makes when
for data. *NeXTWORLD*
d loudness with a decibel
foot from the front of the
nclosures. Drives from
ıd Microtech were particu-
iet.
also worthwhile to con-
"extras" offered by various
to entice the purchaser.
or drive includes 20MB of
lomain software rounded
ıe Bay Area NeXT Group,
nple. The Cube Route's
ıclude a nifty auto-power
that makes it unnecessary to
the drive when you turn
computer – the drive shuts
utomatically. Liberty Sys-
fers a drive that is small
to carry in a book bag. The
on and on. Only you will
ıe real value of any feature.
ıich vendor did *NeXT-*
D like best? Tecor offers a
lection of drives and demon-
NeXT expertise, but one of
s arrived with a loose inter-

ured loise	US Price	Cost per Megabyte[1]
	n/a	n/a
	$2385	$1.77
	$1485	$2.99
	$1895	$2.94
	$2099	$3.32
	$3079	$4.85
	$3311	$2.17
	$1735	$3.33
	$2299	$5.65
	$4399	$6.93
	$3400	$2.52
	$999*	n/a
	$838*	n/a
	$849*	n/a

e drive unit plus one cartridge.

You can take it with you

Living with a portable disk drive

The original NeXTcube never lived up to the promise of portable mass storage. What was advertised was a 5.25-inch cartridge that we could carry around and use to store everything we had ever worked on. What we got was the NeXT's optical drive – slow at best and unreliable at worst, thanks to a problem with dust that NeXT was never able to satisfactorily solve. So instead of using the optical drive for primary storage, people used them strictly for backup and transporting data from place to place.



Of course, this left NeXT users with the same problem that the optical drive was designed to solve: having all of your data at home, and being at work, or vice-versa. Maintaining two sets of everything – and keeping everything in sync – is a considerable pain.

With the appearance of the NeXTstation, programmers in NeXT's software engineering group started solving the problem a different way. Although the NeXT's MegaPixel Display is quite a hefty load, the NeXTstation itself doesn't even tip the scales as much as some so-called "laptops." Several programmers started keeping a display at work and another at home and moving their slabs back and forth on the weekends.

If lugging around a 14-pound workstation just isn't your cup of tea, perhaps you should consider one of the removable disk drives mentioned below. Each has its own advantages and disadvantages, and offers you high-speed access to all of your data without having to break your back in the process.

Give me liberty

The Liberty drive is a paperback book-sized enclosure that packs a 425MB, 3.5-inch Quantum hard disk (the same drive that is in many NeXTstations). A 525MB version is also available. Built into the enclosure is a power supply and two 25-pin SCSI connectors. The drive even comes with a trendy leather carrying case that protects against shock.

The best way to use the Liberty is to use BuildDisk to put an entire operating system on it, set the drive's SCSI Target ID to 0 and boot off it as your main system disk. Keep all of your files on it and carry it from home to work.

Significantly larger disks (1GB and up) should be available by the time you read this. Just don't forget to back up the Liberty. Otherwise you might be out of luck if you lose it on the subway or encounter some other disaster.

Removable cartridge

If you would rather not carry around your entire operating system, but still want to be able to access and transport massive amounts of data quickly, you might want to consider one of the two removable cartridge disk systems now available for the NeXT.

Manufactured by SyQuest and Ricoh, these mutually incompatible systems provide you with a convenient way for storing 44MB to 80MB of information on a removable cartridge. NeXT's Workspace Manager treats these cartridges much like large (and fast) floppy disks; you can pop them in and out of the drive almost at will. Need another 88MB? Plunk down $150 and you've got it. Even better, you can take it with you, as long as you have a compatible drive wherever you are going.

Both the SyQuest and Ricoh cartridges contain the same hard metal disks that you'd find if you opened a sealed Winchester hard disk. Without those protective seals, smoke, dust, pollen, and other environmental contaminants can play havoc with the data stored on these disks.

If you elect to use one of these removable cartridge systems, don't leave the cartridge halfway in the drive when it is not in use – put it back in its case. Don't smoke around the drive or the cartridge. Don't drop the cartridge. Even following these rules, though, is no guarantee; we noticed repeated soft and hard errors when testing these drives at *NeXTWORLD*. Our recommendation is that you don't use them for primary data storage, just use them for backup and transportation.

One removable cartridge system that looks promising is Iomega's Workstation 90 Bernoulli drive. In our tests, this drive had a faster disk transfer time (although slower seek time), than both the SyQuest and Ricoh. Even better, we did not experience a single hard or soft error with the the Bernoulli cartridges during our testing. Unfortunately, a minor incompatibility between Workspace Manager and Workstation 90 drives prevents smooth integration at this time. Iomega says that the Workstation 90 should be released for the NeXT computer sometime this year.

by SIMSON L. GARFINKEL

nal connector. The Cube Route had two unexceptional drive mechanisms when we checked, but has an established reputation as experts. Park Systems Technology offered one piece of unreliable information (NeXT '040 computers only partially support SCSI-2) but showed an undeniable enthusiasm. Liberty Systems shipped the wrong cable (the SCSI-2–to–DB25 cable was backordered), but its unique drive made countless trips from our offices to an editor's home. Finally, Microtech, MicroNet, and PLI have the staff and financial backing to make it easier for an MIS manager to sleep at night.

Setting up a drive

Once you've evaluated the options and taken the plunge, you're ready to set up your hard disk. The *NeXT Network and System Administration* manual covers the basics. Make one decision first: Is the new external drive going to be the system startup disk? If the new drive is bigger and faster than the built-in NeXT drive, you'll probably want it to be your boot disk. Use it to store both your operating system and user files and you'll notice a performance improvement. Use your internal drive for virtual memory by renaming it "swapdisk." If you only use the internal drive for

swapping, it will have to seek less, and your virtual memory performance will be improved as well.

The last SCSI device on the bus must be properly terminated. Some vendors provide a switch that turns on termination; other drives require a terminator plug or employ an internal terminator that can be removed. A rotary switch or dip switches allow you to set a SCSI Target ID number. Your NeXT's internal hard disk has a SCSI ID of 1. Set the new disk for 2.

Connect the drive to the NeXT's SCSI port and power on the computer. If your vendor hasn't formatted the disk, you'll see an alert panel after you log in stating that the disk is unreadable. Click Initialize.

Unless you are the lone user of your NeXT, you'll want to configure your new disk to enable use of file permissions. The procedure is not automatic in NeXTstep 2.1: You must edit the **/etc/fstab** file and add an entry for the **/dev/sd1a** like this:

/dev/sd1a /Disk2 rw,noquota,noauto 0 2

After adding your new disk to the **/etc/fstab** file, reboot your computer and you'll be able to set file permissions as you have in the past.

If you intend to use the new drive as a system startup disk, you must install the system software with the BuildDisk program. After the utility has copied the needed system files to the new disk, you'll need to turn off the computer, set the drive's SCSI ID to 0, and power on the computer. Your NeXT will boot from the new hard drive.

With your new drive installed, you are now prepared to experience the pleasure of computing with elbow room – at least until your proliferating files put you back in the market for even more storage.

DANIEL MILES KEHOE *is a* NeXTWORLD *contributing editor. He can be reached at dkehoe@nextworld.com.*
SIMSON L. GARFINKEL, *a senior editor at* NeXTWORLD, *developed the benchmarks and managed the testing for this report.*

Manufacturer's specifications for currently available 5.25-inch and 3.5-inch drives

		Manufacturer's Model	Lowest Price	Size (in.)	Factory Capacity (MB)	Raw Capacity (MB)	Average Seek (ms)	Transfer Rate (ms)	Spindle (rpm)	Typical Warranty	Reliability (MTBD)
2.4GB	Seagate Elite	ST42400N	$3000	5.25	2400	2100	11.0	5.0	5400	5 years	150
1.6GB	Maxtor	P1-17S	$2600	5.25	n/a	1500	13.5	1.8	n/a	2 years	100
	HP	97560T-300-1	$2550	5.25	1610	1340	13.5	1.5	4000	5 years	150
	Seagate Wren 8	ST41650NM	$2400	5.25	1650	1450	15.0	n/a	3600	5 years	150
1.2GB	HP	97558-300-1	$2300	5.25	1270	1080	13.5	1.5	4000	5 years	150
	Fujitsu	M2266SA	$2200	5.25	1270	1080	14.5	2.0	3600	5 years	200
	Maxtor	P0-12S	$1950	5.25	n/a	1030	13.0	1.2	n/a	2 years	100
	Seagate Wren 7	ST41200N	$1900	5.25	1280	1050	15.0	1.9	3600	5 years	100
	IBM	H12	$1800	3.5	1280	1110	9.8	3.0	4300	2 years	400
	Micropolis	2112	$1800	3.5	1220	1050	10.0	5.0	4500	5 years	250
660MB	Seagate Wren Runner 2	ST4767N	$1700	5.25	767	676	10.7	4.7	4800	5 years	100
	HP	94556-300-1	$1650	5.25	795	673	16.5	1.5	4000	5 years	150
	Fujitsu	M2263SA/HA	$1395	5.25	778	688	16.0	1.9	3600	5 years	200
	Seagate Wren 6	ST4766N	$1395	5.25	766	676	15.5	1.9	3600	5 years	100
	Seagate Wren 5	ST4702N	$1395	5.25	702	613	16.5	1.5	3600	5 years	100
	Maxtor	8760S	$1395	5.25	760	675	16.0	n/a	n/a	2 years	100
Small drives	Fujitsu 520MB	M2624SA/T	$1495	3.5	600	520	12.0	3.0	4400	5 years	200
	Maxtor 535MB	LXT 535S	$1400	3.5	n/a	535	n/a	n/a	n/a	1 year	100
	HP 422MB	C2235S	$1395	3.5	n/a	422	13.5	1.5	n/a	5 years	150
	Fujitsu 422MB	M2623SA/T	$1395	3.5	500	425	12.0	3.0	4400	5 years	200
	Fujitsu 330MB	M2622SA/T	$1295	3.5	400	330	12.0	3.0	4400	5 years	200
	Seagate 426MB	ST1480N	$1250	3.5	492	426	14.0	4.0	4400	5 years	150
	Seagate 338MB	ST1401N	$1200	3.5	390	338	12.0	4.0	4400	5 years	150
	HP 328MB	C2234S	$1150	3.5	n/a	328	13.5	1.5	n/a	5 years	150
	Maxtor 330MB	8380S	$1150	5.25	n/a	330	n/a	n/a	n/a	2 years	100
	Seagate Wren Runner 1	ST4385N	$1125	5.25	385	357	10.7	1.9	3600	5 years	100
	Maxtor 330MB 3.5"	LXT 340	$1100	3.5	n/a	330	15.0	n/a	n/a	1 year	100
	Seagate Wren 4	ST4376N	$900	5.25	376	330	16.0	n/a	3600	5 years	100

Vendors

Computer Attic
10251 S. DeAnza Blvd., Cupertino, CA 95014. 408/253-5300.

The Cube Route
430 Broadway, Cambridge, MA 02138. 617/244-6061, 800/282-3783.

Iomega Corporation (manufacturer of Bernoulli drives)
1821 W. 4000 S., Roy, UT 84067. 800/456-5522, 800/777-6101.

Liberty Systems
160 Saratoga Ave. #38, Santa Clara, CA 95051. 408/983-1127, 408/243-2885 fax.

MicroNet Technology
20 Mason, Irvine, CA 92918. 714/837-6033, 714/837-1164 fax.

Microtech International
158 Commerce St., East Haven, CT 06512. 203/468-6223, 800/626-4276.

NeXTConnection
9 Mill St., Marlow, NH 03456 603/446-7771, 800/800-6398, 603/446-7791 fax.

Park Systems Technology
10971 – 101 St., Edmonton, Alberta, T5H 2S9 Canada. 403/424-0530, 403/421-4039 fax.

PLI
47421 Bayside Pkwy., Fremont, CA 94538. 415/657-2211, 800/288-8754, 415/683-9713 fax.

SyQuest Technology
47071 Bayside Pkwy., Fremont, CA 94538. 510/226-4000, 800/245-2278, 510/226-4102 fax.

Tecor
237 Miramar Dr., Santa Cru
CA 95060. 408/458-3197, 408/425-1804 fax.

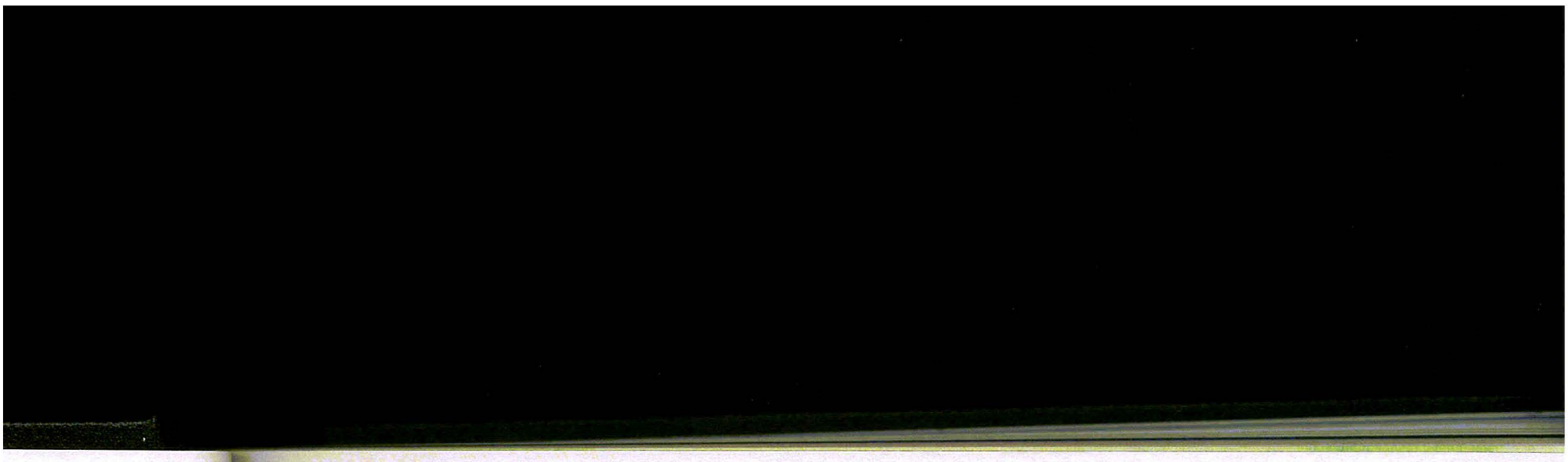


Despite echoes o
the image of the
house, and a dep
ity: This Sheriff's
it's growing.
42 of the county's
an average daily
world and the sec

DI
HOW NeXT
AT
DE

SIMSON00000896

SIMSON00000897



now prepared to experience
ure of computing with
om – at least until your pro-
files put you back in the
or even more storage.

L MILES KEHOE
TWORLD *contributing*
e can be reached at
nextworld.com.
N L. GARFINKEL,
editor at NeXTWORLD,
d the benchmarks and
the testing for this report.

.5-inch drives

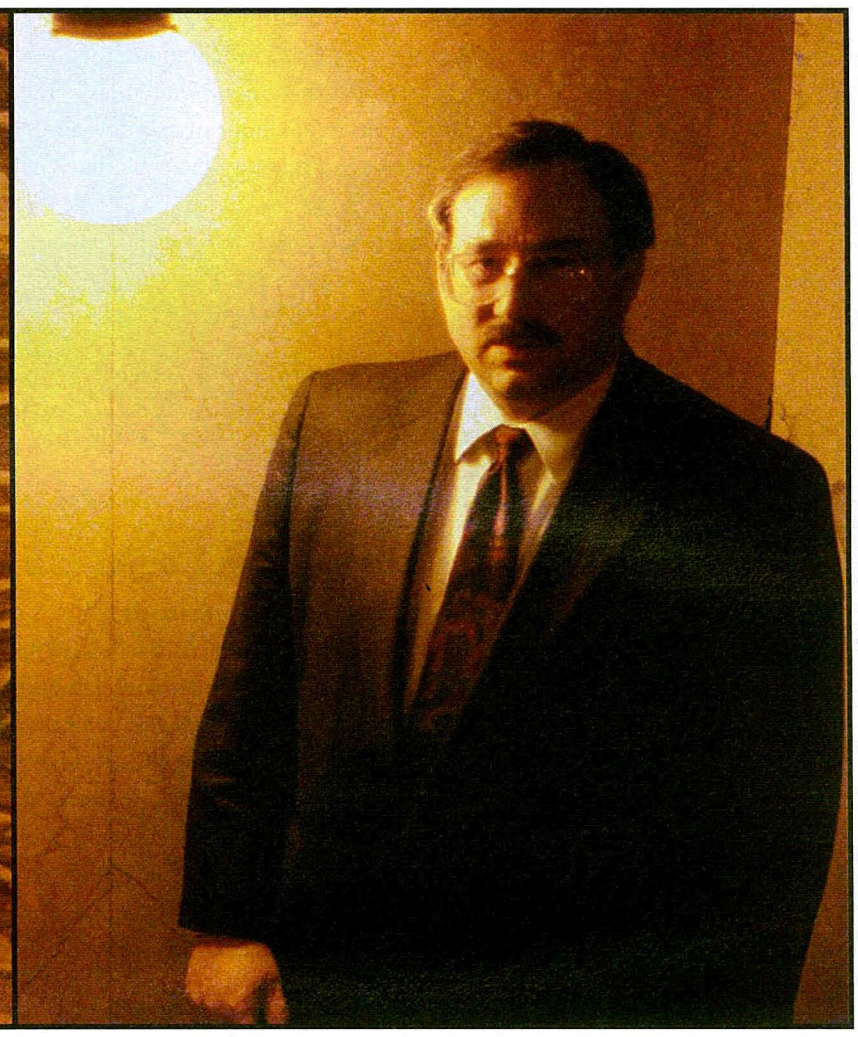
Typical Warranty	Reliability (MTBD)
5 years	150
2 years	100
5 years	150
5 years	150
5 years	150
5 years	200
2 years	100
5 years	100
2 years	400
5 years	250
5 years	100
5 years	150
5 years	200
5 years	100
5 years	100
2 years	100
5 years	200
1 year	100
5 years	150
5 years	200
5 years	200
5 years	150
5 years	150
2 years	100
5 years	100
1 year	100
5 years	100

Tecor
t, 237 Miramar Dr., Santa Cruz, CA 95060. 408/458-3197,
fax. 408/425-1804 fax.

t,

fax.





Despite echoes of the Old West in its name, the Los Angeles County Sheriff's Department is a far cry from the image of the lone lawman trying to keep the peace with little more than a silver star, a horse, a jail house, and a deputy or two. Consider just a few of the differences between the movie myths and the reality: This Sheriff's department has some 13,000 employees and a budget of more than a billion dollars – and it's growing. ✪ Providing law enforcement for the unincorporated areas of Los Angeles County, as well as 42 of the county's incorporated cities, the department's jail system is the largest in the western world, with an average daily population of 22,000 inmates. The department runs the largest institutional laundry in the world and the second-largest bus fleet in California, and maintains extensive dairy and bakery operations.

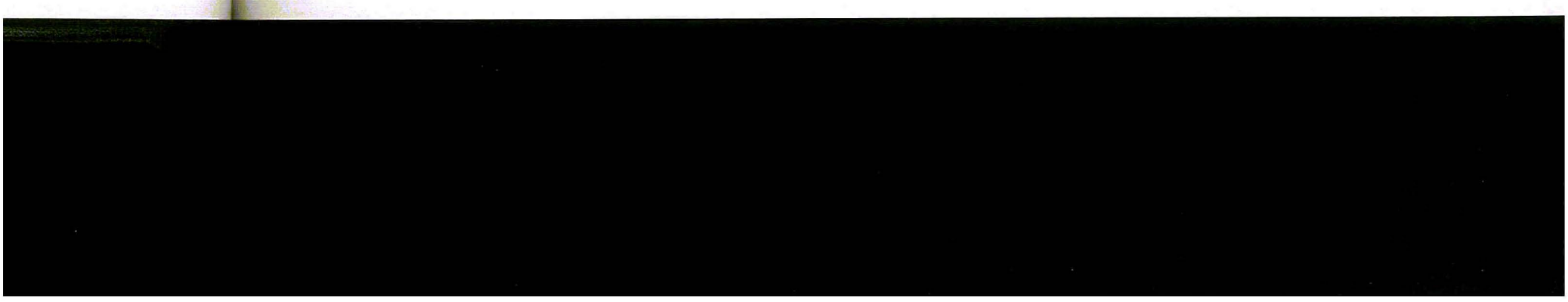
DIGITAL DEPUTY

HOW NeXT WON THE SHOOT-OUT AT THE L.A. CORRAL

NeXT User Profile
Organization: Los Angeles County Sheriff's Department
Business: Law enforcement
Employees: 13,000
Hardware: 300 NeXT systems
Software: Frame Technology Corporation's FrameMaker desktop publishing software, Boss Logic's document management system, Informix Corporation's Wingz spreadsheet, Oracle Corporation's RDBMS.
Purchase cycle: A late entrant in a formal procurement process, NeXT won the bid with its second proposal.
Costs: $6 million. Approximately 60 percent hardware, 40 percent software and services.
Immediate goal: Provide executives with better and more timely information for decision making.
Long-range goal: Empower lower-level managers and support personnel with advanced decision-making tools.

Written by Paul Karon

PHOTOGRAHS BY STUART WATSON



Were the Los Angeles County Sheriff's Department ranked on the *Fortune 500* list for service organizations in the nation, it would hold number 65. Add to this the fact that Sheriff's deputies may be forced to make life-or-death decisions at any hour of any day, and you begin to get some idea of the management difficulties faced by the department's top executives.

Needless to say, installing a computer network that would help manage all these elements was no easy task. The department's information systems strategists wanted some "simple" things: a computer system that would provide top executives with a few basic applications; share a common, graphical user interface; and be seamlessly integrated with the computer applications for all of the administrative and support staff. Simplicity like that, however, has always been a complicated thing to find in a computer.

For the Los Angeles County Sheriff's Department, the answer didn't ride into town wearing a white hat. Instead, it came in a black box.

When the department started looking for a computer-based executive support system, ordering 300 NeXT workstations was probably the last thing in the world Claude Farris, captain of the Data Systems Bureau, thought he was going to do. In fact, the story of the Sheriff's department's search for the best workstation for the task goes back to a time even before Steve Jobs's young firm could have been a serious contender for the department's business.

The blueprints

It was in 1987 that the data systems bureau started drawing up blueprints for a new computer system to serve the organization's top executives. But their first brush with existing executive information systems then on the market left them cold. "We had a thorough understanding of our business processes and we were looking for a system that would automate that process," says Farris. "A lot of products we were looking at seemed to substantially miss the mark." The dissatisfaction lay in the department's particular vision for executive support and information.

"One of the things that struck us relatively early in the process was that the right term was 'executive support system,'" says Farris. Not, he explained, an 'executive information system'.

Existing executive information systems operated at what Farris calls the very tip of the information-processing pyramid. Typically, these products enabled executives to generate graphs and charts of corporate information at the touch of a button. But Farris and the Sheriff's department weren't in the market for a computer system just for the few top executives. "We decided we needed to have an environment that allowed us to be very responsive to the business processes that applied to each and every individual supporting that executive. But nothing on the market at the time seemed to do this smoothly," says Farris.

"We felt we needed to support executives in the ways they already worked," he says. While an administrative secretary may be comfortable using a word processor and e-mail, Farris explains, most Sheriff's department executives were accustomed to verbal communication. "We realized that we needed to give them a way to integrate voice messages into a text document, or a chart, or a graph," says Farris. This degree of multimedia functionality was the type of thing that sharply narrowed the field of computer firms under consideration.

Specifically, Farris and his colleagues wanted to tie together the sheriff, the undersheriff, two assistant sheriffs, eight division chiefs, 26 commanders, and all the related clerical and administrative support staffs. The whole system would come to about 300 people, spread out over nine different geographic locations, linked by a T-1 network.

Early on, the department had decided that the executive support system would be UNIX-based. "The decision was to implement an open systems architecture. The only open system that would give us multiuser and multitasking features was UNIX," says Farris.

One by one, the major UNIX workstation players made their pitches. All the usual suspects showed up: DEC, IBM, HP/Apollo, Sun, Apple, and others. But in every case, Farris says, information systems strategists at the Sheriff's department were put off: They wanted things simple; they wanted to find a company whose fundamental ideas about computer support more nearly matched their own.

They searched for a year, and then a second and a third. The department's information strategists continued to talk with computer firms but were unwilling to compromise on their requirements for functionality or ease of use. Fortunately for Farris, the top brass wanted the job done right – rather than fast. "Once the fish hits the hook and is running, that's not the time to test the reel and the line," says Farris.

The Lone Ranger

Farris and his colleagues had been meeting with computer firms for more than a year when NeXT rode into town. It was late 1988 when salespeople from Businessland – then a NeXT VAR – came to the department's downtown Los Angeles headquarters.

The Businessland sales reps were toting the original Cube. They fired up the black box and put it through its paces. Farris was impressed – but not overwhelmed. "Our reaction at the time was that it had a lot of nice interface qualities to it," he says, "but it was very slow and didn't have the software applications to meet our requirements." Besides, at a cool $10,000 a seat, the NeXTcubes were beyond the budget's reach. The Sheriff's department told Businessland what they were telling most vendors at that time: "Thanks. Keep us informed."

Despite its problems, NeXTstep was the first software environment Farris had seen that had the kind of cohesive interface the department was looking for. By the spring of 1990, information systems managers at the Sheriff's department were despairing of finding the perfect match. Even their leisurely, academic search had its practical limits. "We were grinding down to the point where we needed to make some decisions," Farris says.

The department was well down the path on a deal with Sun Microsystems when a phone call came in from NeXT. It was nearly too late, but NeXT wanted to hold a nondisclosure meeting to talk about some new products. Farris was willing to meet, but he didn't expect miracles.

At the time, the Sheriff's department was still driving toward X Windows, and they wanted to see X Windows on the NeXT. "Quite frankly, we didn't think they were going to have a product that met our requirements," Farris says. "We didn't think they would play well."

They were wrong. NeXT surprised them, not so much with their technology, but with their plans for the future – the NeXTstation primary among them. "This finally seemed to address our concerns," says Farris. But the machines weren't on the market yet. "We weren't going to buy vapor products," he says. Nevertheless, the department was sufficiently intrigued to put off any decision a bit longer.

The decision

The next time Farris heard from NeXT was late 1990 – just weeks before

the firm went public with
candidate. But at that poi
doubts centered around t
Jobs understood their co
officials that the compan
us with information that
cial viability," says Farris

That concern gone, t
ate the sale, and by mid-
shrinkwrapped applicati
that time will save the de
mentation costs and actu

For example, in no c
Frame Technology Corp
to create an electronic fo
paper forms already in u
says Farris. And with Ne
can easily file the forms i

The department will
Corporation. The spreads
SQL-based Relational Da

Among the most im
in the Sheriff's executive
tem from Boss Logic.

The Boss Logic docu
Sheriff's department, exp
Francisco–based Boss Lo
ments – hundreds of thou
system at the Sheriff's de
security. "Security is ever

"The Boss Logic sys
Town says. That way, he
to see it. Users don't ever
need to ask.

One of the most pre
ment system is also the c
charges of improper use
major concerns for the d
force questions has reach
that work on this part o
accordingly.

Alain Pinel:
Since Hele
Alain Pinel
"Fast Sell,"
her network carefully

"We've been able
to," she explains, allo
and link it to a second
Saratoga, California,

Pastorino, workin
to install 17 customiz

SIMSON00000898

66800000NOSWIS

spread out over nine differ-
rk.
:he executive support
vas to implement an open
would give us multiuser
ris.
layers made their pitches.
P/Apollo, Sun, Apple, and
systems strategists at the
things simple; they wanted
ut computer support

and a third. The depart-
with computer firms but
ients for functionality or
wanted the job done right
nd is running, that's not
s.

computer firms for more
ate 1988 when salespeo-
ne to the department's

riginal Cube. They fired
rris was impressed – but
that it had a lot of nice
slow and didn't have the
' Besides, at a cool
budget's reach. The Sher-
e telling most vendors at

software environment
rface the department was
ystems managers at the
ie perfect match. Even
mits. "We were grinding
ie decisions," Farris says.
a deal with Sun Micro-
t was nearly too late,
ing to talk about some
didn't expect miracles.
driving toward X Win-
NeXT. "Quite frankly,
t that met our require-
play well."
so much with their tech-
eXTstation primary
concerns," says Farris.
weren't going to buy
tment was sufficiently

990 – just weeks before

the firm went public with the NeXTstation. NeXT was suddenly a top candidate. But at that point, one of the department's most significant doubts centered around the still-unproven firm's chances for survival. Steve Jobs understood their concerns, and he managed to reassure department officials that the company wasn't going to run out of money. "He provided us with information that made us comfortable about the company's financial viability," says Farris.

That concern gone, the Sheriff's department was finally able to negotiate the sale, and by mid-summer of 1991 the deal was done. Farris says the shrinkwrapped applications available for the NeXT environment even at that time will save the department significant money in both initial implementation costs and actual day-to-day operation.

For example, in no other software application was it as simple as in Frame Technology Corporation's FrameMaker desktop publishing tool to create an electronic form on the screen that exactly reproduced the paper forms already in use by the employees who had to use those forms, says Farris. And with NeXT's built-in e-mail, administrative employees can easily file the forms in a server database.

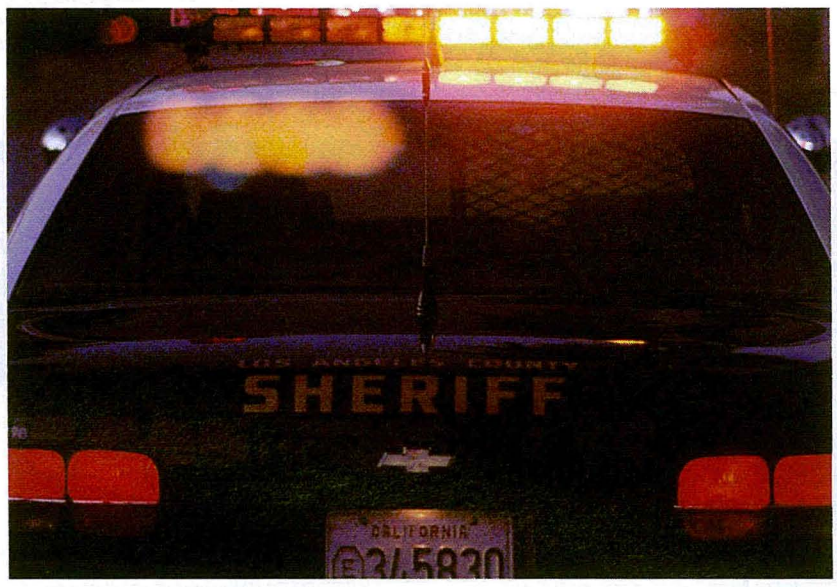
The department will also use Wingz, the spreadsheet from Informix Corporation. The spreadsheet will work in tandem with Oracle Corporation's SQL-based Relational Database Management System.

Among the most important of the software applications that will run in the Sheriff's executive support system is a document management system from Boss Logic.

The Boss Logic document manager faces two daunting tasks at the Sheriff's department, explains Philip Town, president and CEO of San Francisco–based Boss Logic. First, it has to handle a huge number of documents – hundreds of thousands, in fact – Town says. Second, any computer system at the Sheriff's department must provide virtually unbreachable security. "Security is everything to these guys," Town says.

"The Boss Logic system provides security at the database server level," Town says. That way, he explains, a document "knows" who is supposed to see it. Users don't even have to know if they have access; they simply need to ask.

One of the most pressing applications for the new document management system is also the department's most serious current issue – tracking charges of improper use of force. Though these charges have long been major concerns for the department, public and internal scrutiny of use-of-force questions has reached a peak in recent months, and Farris says that work on this part of the document manager has been accelerated accordingly.



"We sorely need to integrate and automate our internal investigation process," says Farris. "We need to track information in far greater detail and in a fashion that's not been done before." The system will integrate all aspects of citizen complaints, civil litigation, personnel records, and all use-of-force and officer-involved shootings, he says. "When you're looking for something that's mission-critical, this is about as mission-critical as you can get."

While Farris feels he is purchasing excellent technology from NeXT and the application-software firms involved in the system, the captain also wanted – and is getting – the sense that NeXT has become more of an ally than a supplier. For example, Farris hears regularly from Todd Rulon-Miller, vice president of sales and marketing at NeXT.

These calls come in addition to the more-frequent telephone and on-site contact with NeXT's engineers and sales people from the local office in Calabasas, California. This kind of personal attention is crucial to his happiness with NeXT, Farris believes.

Farris finds the approachability of NeXT's top executives gratifying. "Generally, they're very receptive to constructive criticism," says Farris. "I hear (Jobs) on a regular basis asking, 'Well, what do you think about this?' Someone like Lee Iacocca would never do something like that."

PAUL KARON *is a free-lance writer based in Los Angeles.*

UPDATE

Alain Pinel: Second office networked

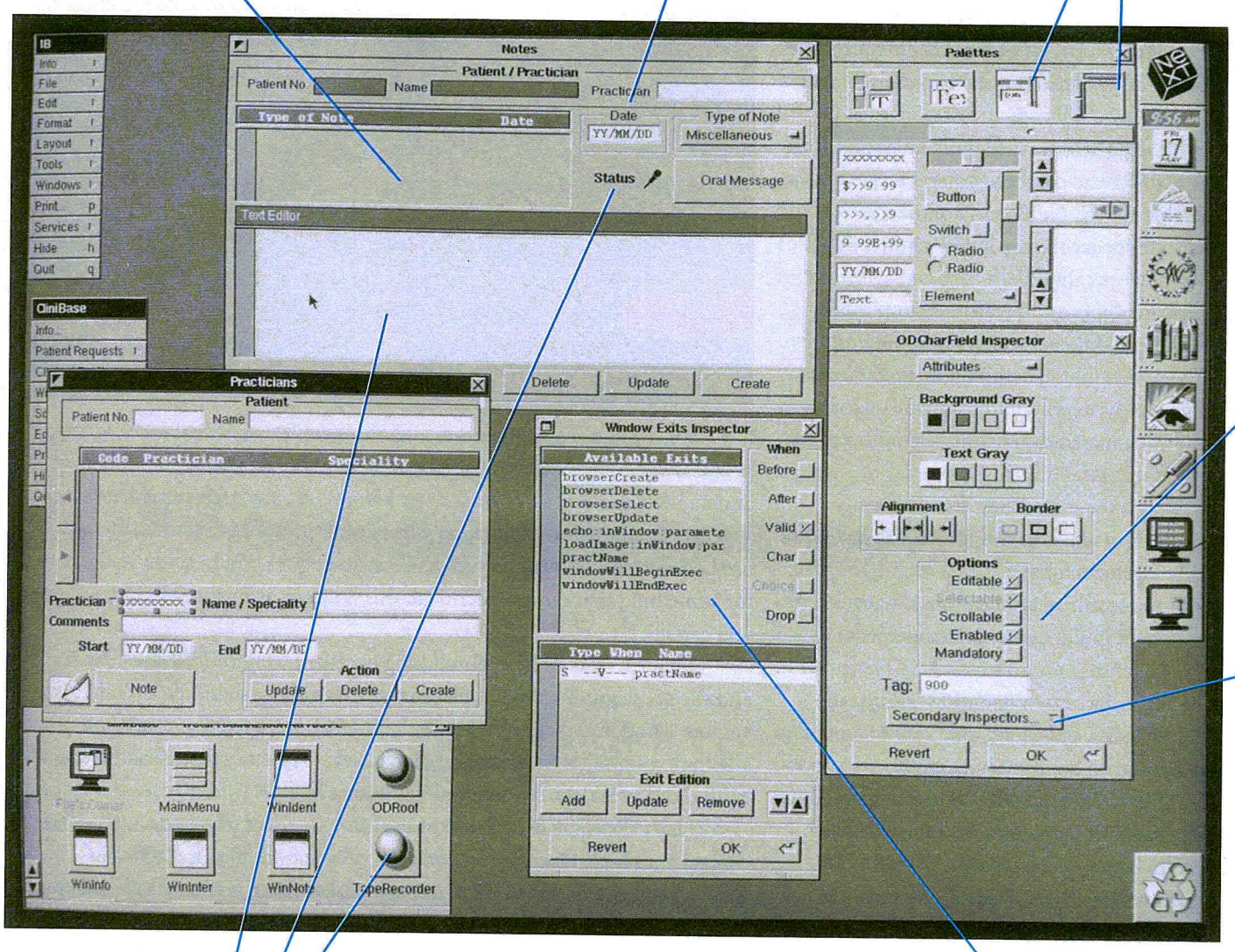
Since Helen Pastorino installed 65 NeXT machines at Alain Pinel Realtors in Los Gatos, California, in May (see "Fast Sell," *NeXTWORLD* Winter 1991), she's built her network carefully – and it's paid off.

"We've been able to quickly set parameters for everyone to adhere to," she explains, allowing Alain Pinel to easily troubleshoot the network and link it to a second installation of another 65 machines in Pinel's Saratoga, California, office.

Pastorino, working with Adamation in Oakland, has been able to install 17 customized modules for tracking the industry's Multiple Listing Board, perform competitive and comparative market anlayses, and tailor versions of Adamation's Who's Calling to work client and geographic databases.

"Because of the NeXTs, we've been able to recruit and retain 80 of the best agents in the area," Pastorino says. "The two offices are now ranked first and second in their respective markets, against huge firms that have been there for ten years, and who had been dominant."

by ELIOT BERGSON



Introducing

Objective DB Toolkit™

A powerful programmer's interface bridging the gap between SYBASE database and NeXTstep Interface Builder.

This versatile programming environment is designed for the serious applications developer who needs to tap the power of SYBASE® without having to resort to the intricacies of 3GL coding. Objective DB Toolkit™ allows you to build and debug your whole application from within the Interface Builder™.

So, if you're working with SQL and are familiar with NeXTstep®, put Objective DB Toolkit to the test. It'll increase your productivity dramatically.

Easy Database Access

The database interface is designed to be simple enough for untrained personnel to format database queries: all you have to know is SQL. And, we made sure that the interface would respect NeXT™ standards and let you build applications using the NeXT environment as its standard.

Shorter Development Cycle

To build a simple application, you design the user interface from the specifications using Interface Builder. Once your interface has been accepted, you build the data structure to support it and make the connections with standard SQL select and update statements. A basic reporting capability is automatically included.

Flexibility

Ease of use does not preclude flexibility. Any field value may be substituted in SQL statements. Internal variables may be used to communicate data from field to field and from window to window. Exits may be cascaded in a single field. You may also add some dedicated specialized exits coded in objective-C.

NeXTstep is a registered trademark of NeXT, Inc. NeXT and Interface Builder are trademarks of NeXT, Inc.
SYBASE is a registered trademark of Sybase, Inc. Objective DB Toolkit is a trademark of Professional Software, Inc.

Circle 33 on reader service card

COMING SOON
Objective DB Designer™
A VISUAL INTERFACE TO SYBASE

PSI Professional Software, Inc.
599 North Avenue, Suite 7
Wakefield, MA 01880
FAX 617-246-1443

DEMO DISK available.
Call 617-246-2425

Flat a

DataPhile, S database, fil

by BEN CALIC

One type of so NeXT machi lacked is data long as you v base jock who could ma the high-end offerings f Informix, and Sybase. F those who don't consid your own database in C to do on a Saturday aft options for a simple da nonexistent.

Well, get ready to p address file out of Writ stop printing mailing la spreadsheet, and put yo with FileMaker back o Stone Design's DataPhi entry in the flat-file data a solid first version of a needed product.

DataPhile is not re multi-user, or scriptable straight flat-file databas storing, searching, and reports like mailing lab from a single file of info If you are responsible f databases that have to of cross-referencing or highly automated, you with one of the relation base engines. But if you with a personal databa needs to kick out lots o envelopes, and do a bit tion, your life is about

Fielding the first

Getting started with D a matter of defining the information to be track define each field as Tex Number, Money, Boole Graphic, Sound, or File

SIMSON00000900

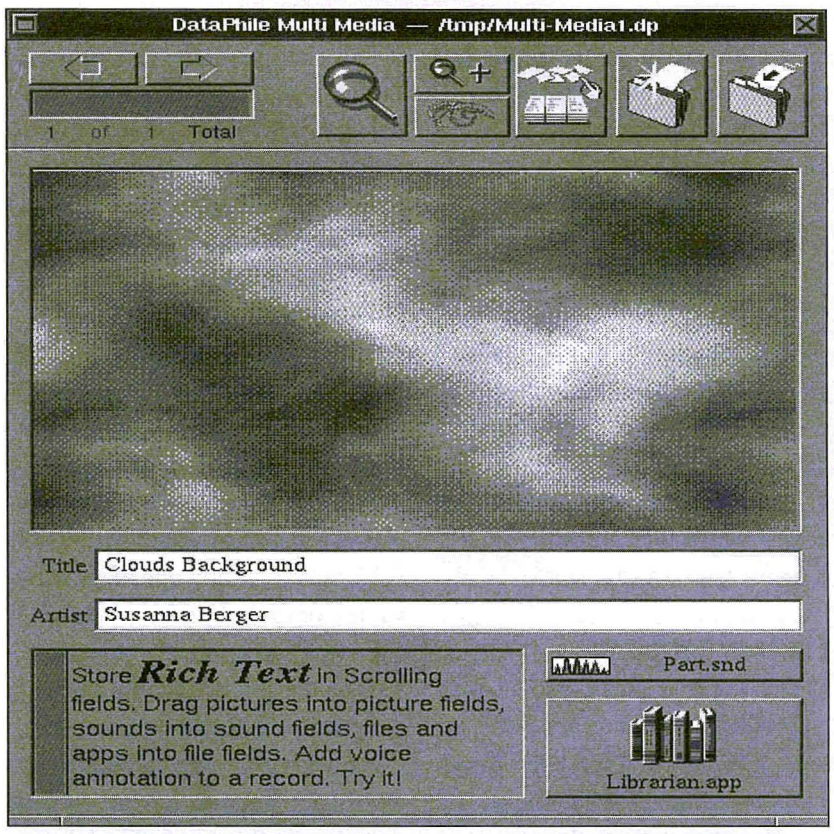
10600000NOSWIS

through two
eir associated
e to remember
o what end.

Flat and Sharp

DataPhile, Stone Design's flat-file database, fills the niche with aplomb

by Ben Calica



DataPhile views can contain many types of data, including text, sound, images, and files (such as the Librarian application shown here). The buttons in the top panel are standard to every DataPhile view, bringing up panels for searching, sorting, and saving the file.

Inspectors may be used to define all field specifications.

Secondary inspectors govern access to database interface, SQL exits and more.

One type of software the NeXT machine hasn't lacked is databases – as long as you were a database jock who could make sense of the high-end offerings from Ingres, Informix, and Sybase. But for those who don't consider rolling your own database in C a fun thing to do on a Saturday afternoon, options for a simple database were nonexistent.

Well, get ready to pull your address file out of WriteNow, stop printing mailing labels from a spreadsheet, and put your Mac with FileMaker back on the shelf. Stone Design's DataPhile, the first entry in the flat-file database race, is a solid first version of a desperately needed product.

DataPhile is not relational, multi-user, or scriptable. It's a straight flat-file database, good for storing, searching, and building reports like mailing labels and lists from a single file of information. If you are responsible for a set of databases that have to do a lot of cross-referencing or need to be highly automated, you should stay with one of the relational database engines. But if you're dealing with a personal database that needs to kick out lots of labels and envelopes, and do a bit of calculation, your life is about to get easier.

Fielding the first file

Getting started with DataPhile is a matter of defining the types of information to be tracked. You can define each field as Text, Date, Number, Money, Boolean (yes/no), Graphic, Sound, or File (for attaching documents and applications to a record).

Once a field is created, it's possible to go back and set various options. Most field types let you define an allowable range of values (an easy way to catch a typo before someone is listed as being 250 years old instead of 25) or create a list from which the user can select the most commonly used entries for that field.

Another option lets you calculate the value of a field. The functions include math, text, and date functions, as well as a basic "if" statement. Included in the options for the Date field is the ability to automatically tag when a record is created or last worked on.

As long as you bring in data from the original source with the field names in the first record, importing data is a breeze. DataPhile can import any text format. The field names of a chosen database are displayed in DataPhile's Import Records panel, where you can drag the fields into any order. You can also have DataPhile create a new database to match the field names it finds.

Enjoy the views

Each data file can be examined in any number of different views, which you construct by creating on-screen forms. You can access the views for a database with DataPhile's View Browser. DataPhile provides drawing tools – for grids, object alignment, text, ovals, rectangles, polygons, and so on – for creating forms. The NeXT's drag-and-drop interface comes in handy here: You can pull in TIFF or EPS files from the Workspace and simply drop them on the form to add a graphic. Unlike most databases, DataPhile makes it very easy to create professional-looking layouts.

If you want to put more than one field on one line, for instance, putting the first-name field and the last-name field on an address line, you need to create a calculated field that pastes the text together, an easy task using preset Define options.

DataPhile lets you have multiple views of the same data open at one time, and each one keeps its own Find and Sort sets. This allows you to conveniently examine, say, business contacts in one view and personal contacts in another. Unfortunately, there's no concept of a "currently found set" of records that you can view in different forms.

You can print any view for a quick report or, to print a found set, take advantage of some special features. To export a data set, you can take advantage of DataPhile's reports, which take the data and layout from the current view. The program offers special report formats for labels and envelopes.

The fact that it is so easy to get good results makes the flaws in this system somehow more aggravating. The most serious problem is that it's not possible to save a form view, so whatever tweaking you do on each label form is lost when you go on to the next. Another major missing feature is an ability to do summary reports or add summary information to reports. DataPhile's solution to this is to include a very clean export to Improv; Improv receives the cur-

DataPhile

beta

The first entry into the flat-file database field, DataPhile fills a giant void in the NeXT market. It's a straight flat-file personal database, good for storing, searching, and building reports from a single file. The interface is clean and what flaws it does have are features to be added later, not misbehaving functions.

$695

Stone Design, 2425 Teodoro, N.W., Albuquerque, NM 87107. 505/345-4800.

COMING SOON
Objective DB Designer™
A VISUAL INTERFACE TO SYBASE
PSI
Professional Software, Inc.
99 North Avenue, Suite 7
Wakefield, MA 01880
FAX 617-246-1443
DEMO DISK available.
Call 617-246-2425

rently selected information with all the field names intact. Similarly, the solution for mail merge is to export to WordPerfect and WriteNow's Merge format.

The NeXT computer won't print to dot matrix printers with tractor feeds – a problem if you want to send labels for bulk mailings to a service bureau, which usually needs labels on continuous sheets. This problem is solved by exporting the database to a Macintosh and printing there. (DataPhile exports as tab-delimited text files.) In addition, it supports bar codes for special labels.

Finders keepers

DataPhile's Find and Sort commands are available from buttons at the top of every form. Both have innovative and easy-to-use interfaces.

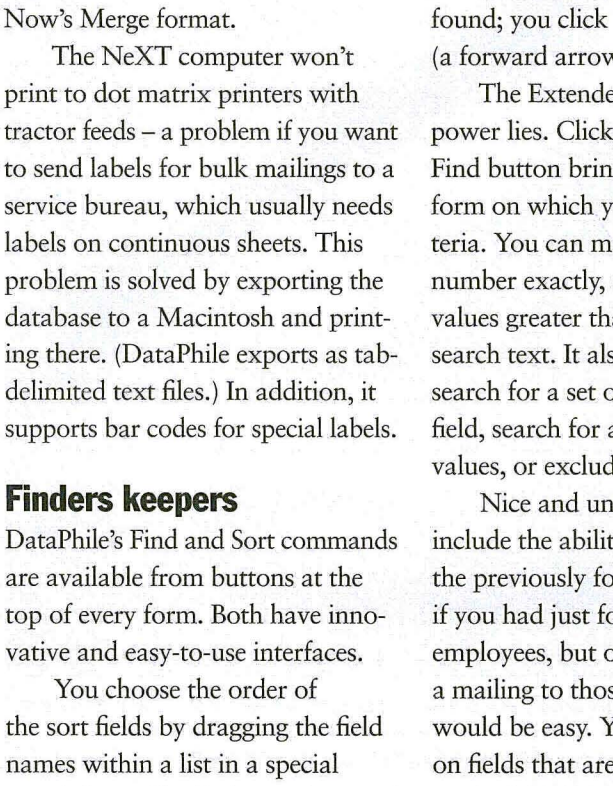
You choose the order of the sort fields by dragging the field names within a list in a special panel. Sorts, like finds, can be saved for future use. You can view any form as a card (one record at a time) or as a list (all records).

DataPhile offers two types of Find commands. You can find other occurrences in a particular field by selecting or typing the word you want to match in the current view and clicking the Find buttton. For example, if "Calif." was selected in the state field, DataPhile would find all other records with "Calif." in that field. DataPhile presents a message telling you how many matches were found; you click the Next button (a forward arrow) to view the rest.

The Extended Find is where the power lies. Clicking the Extended Find button brings up an empty form on which you can specify criteria. You can match a phrase or number exactly, set a range, or find values greater than, or less than, the search text. It also has the ability to search for a set of values within a field, search for any one of several values, or exclude certain values.

Nice and unusual features include the ability to apply a find to the previously found set. That way, if you had just found all NeXT employees, but only wanted to send a mailing to those in California, it would be easy. You can even search on fields that aren't present in a particular view. And you can save found sets under custom names.

Extended Find also lets you search an entire database, not just a particular field. This is a wonderful feature, usually reserved for HyperCard-type products that don't have all the advantages of a real database. The one feature that's missing from this first release is the ability to ferret out duplicate records, the nightmare of anyone who has ever had to do a bulk mailing.



DataPhile's Label report form makes it easy to format a view for easy output to standard label layouts.

Unlike many flat-file databases on other computers, deciding which fields to index for faster searching is up to the user. Since each of these indexes uses a lot of additional disk space, having the option to choose is an advantage that balances having to worry about making that choice.

Flat and sharp

DataPhile's interface is remarkably clean. Sometimes it takes a bit of poking around to find the feature you're looking for, but if you get desperate, Stone Design has included the wonderful Explode Menu feature, which lets you scan for whatever you need. DataPhile is aimed at the single user; although the NeXT's network file system will allow many people to look at copies of the database at the same time, only the first user to open the database can make modifications.

Details like that point out DataPhile's limited goals, which are suitable for the niche it fills. It's a product built for a simple, and much-needed, purpose: to organize personal files in an easy-to-use database. Its innovative, simple interface makes up for its current flaws, all of which can be easily fixed in updates. It does its job well.

BEN CALICA, *founding editor of* NewMedia *magazine, is currently a freelance writer based in San Francisco. In a former life, he was a NeXT advocate for productivity developers, including Stone Design.*

METROTOOLS

Tools to make your NeXT™ more powerful.

Protect your screen by Select a picture as a SCREEN SAVER displaying moving images. Workspace backdrop.

In one step compress, for backup ARCHIVER decompress, or archive files and distribution.

Quickly launch selecting from a APPLICATION LAUNCHER any program by personal menu.

Find a file using not just FILE LOCATOR search criteria, a name.

Easily install new fonts of Macintosh FONT INSTALLER including hundreds type faces.

Import your favorite SOUND IMPORTER Macintosh sounds.

MetroTools enhances the NeXT™ computer, accomplishing tasks more quickly and easily so that you can focus on more important work. By adding the MetroTools icon to your application dock you add a whole array of functions that use one simple interface. Decompress files and import fonts and sounds by simply dropping their icons into the MetroTools panel—MetroTools does the rest. Find files and launch programs quicker. Even when you're not using MetroTools it's at work saving your screen from burn-in. MetroTools is flexible, allowing you to easily customize your environment, and expandable to include new tools and screen saver mdules. MetroTools by Metrosoft. $129.

To order, contact: Metrosoft, 712 Vanitie Court, San Diego, CA 92109
Phone: 800.851.8665 619.597.7518 Fax: 619.488-3045

METROSOFT

Circle 32 on reader service card

Multi Made

MediaStatio presentation

by LEE SHERM

MediaStation NeXT into console for multimedia tations. Similar to autho ronments like HyperCa capability to merge text movies, and video into i presentations, it goes be programs by storing the mation in a searchable, database structure. This multimedia database is for providing multi-dim access to archives in libr ums, and university sett it has recently establishe foothold.

Though it contains formatting tools, Media primary use is for assem sentation from informa in other programs. The easy to use, and the resu impressive, though it w you into Steven Spielbe sentation options are to for that. But it goes a lo toward demystifying th world of multimedia.

Simple and standa

Like HyperCard on the or Toolbook for Windo Station provides differe different users, allowing access to browse, edit, p and other modes. The l complexity rise with ea access.

You begin an archi mode, with a nearly em

SIMSON00000902

ε0600000NOSWIS

ils like that point out
's limited goals, which
le for the niche it fills. It's
built for a simple, and
ded, purpose: to organize
iles in an easy-to-use data-
nnovative, simple interface
for its current flaws,
ch can be easily fixed in
t does its job well.

ALICA, *founding editor*
edia *magazine, is currently*
e writer based in San
. In a former life, he was
dvocate for productivity
s, including Stone Design.

nore powerful.

displaying moving images.
Workspace backdrop.

decompress, or archive files
and distribution.

any program by
personal menu.

search criteria,
a name.

including hundreds
type faces.

Macintosh sounds.

asks more quickly and easily so
the MetroTools icon to your
at use one simple interface.
dropping their icons into the
launch programs quicker. Even
een from burn-in. MetroTools is
and expandable to include new
9.

Diego, CA 92109
9.488-3045

METROSOFT

d

Multimedia Made Easy

MediaStation builds multimedia presentations in a searchable database

by LEE SHERMAN

MediaStation turns the NeXT into a director's console for producing multimedia presentations. Similar to authoring environments like HyperCard in its capability to merge text, sound, movies, and video into interactive presentations, it goes beyond those programs by storing the information in a searchable, reportable database structure. This form of multimedia database is a natural for providing multi-dimensional access to archives in libraries, museums, and university settings, where it has recently established a foothold.

Though it contains a nice set of formatting tools, MediaStation's primary use is for assembling a presentation from information created in other programs. The program is easy to use, and the results are impressive, though it won't turn you into Steven Spielberg – its presentation options are too limited for that. But it goes a long way toward demystifying the complex world of multimedia.

Simple and standard

Like HyperCard on the Macintosh or Toolbook for Windows, MediaStation provides different uses by different users, allowing selective access to browse, edit, presentation, and other modes. The levels of complexity rise with each level of access.

You begin an archive in Format mode, with a nearly empty entry form that is configured with Previous and Next buttons for navigation. You assemble a presentation by dragging fields and buttons from an Item Palette at the top of the screen onto the entry form, resizing them as needed. MediaStation provides separate button types for sound, images, movies, and video, plus three other buttons for playing back a presentation, linking to an archive entry, or launching an external file or application. The default titles on the buttons can be changed to reflect their contents more specifically.

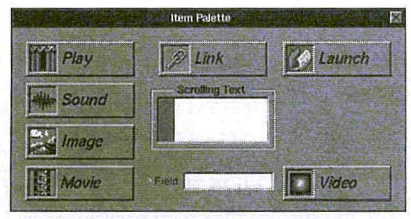
Once you've decided on the look of your archive, you proceed to Enter mode, in which you enter information into the archive. This is where MediaStation shines. While its tools for working with sound, text, scanned images, and movies are no match for those available in stand-alone programs, they are plentiful and well thought-out. And if you have more sophisticated editing tools, you can prepare the effects outside the program and import them easily into MediaStation. The program includes direct interfaces to an array of peripheral devices that sample various kinds of data, including Metaresearch's Digital Ears and HSD's Scan-X. If you have a NeXTdimension, you can bring in color, full-motion video sequences. The program also supports industry-standard data formats like TIFF, EPS, ASCII, and RTF, as well as .snd files and WriteNow format. Unfortunately, it's still missing support for MIDI, a standard means of controlling external musical instruments through computers.

Capture or create

You can record voice-quality and CD-quality audio directly from within MediaStation. The program provides controls for recording, setting the recording length, and checking the integrity of the source with on-screen VU meters. MediaStation also supports a comprehensive set of scanning features (their availability depends on the features of your scanner). You can get a quick-and-dirty, low-resolution scan, then zero in on a smaller section to create a high-resolution file. The image can then be rotated, resized, and repositioned from within MediaStation.

Version 2.0's increased support for video makes it ideal for use with a NeXTdimension system. In previous versions, videos were created in the same way as other animation, by entering each frame separately. It is now possible to bring in a video sequence created with Digital Eye or from a NeXTdimension. The images that make up a movie are simply a series of TIFF files – run through them slowly and you've got a slide show. The program also supports frame-grabbing from the NeXTdimension video ports, displaying incoming video in real time inside a window. You can control external devices, such as laserdisc players and videotape recorders, from within MediaStation, and you can output presentations directly to videotape.

Manipulating video sequences as easily as you once manipulated text and graphics is a revelation.



Users create presentations by dragging buttons and fields onto an entry form from this Item Palette. Once the buttons are in the archive, you can rename them to reflect their content.

You can cut, paste, and reposition individual frames and adjust the playback rate for smoother animation. On a multitasking system like the NeXT, playback speed can be affected by other processes running on the machine. MediaStation has addressed this problem in Version 2.0 by introducing new movie types: skip-frame synchronous, which skips frames in order to maintain timing, and speed-up synchronous, which speeds through certain frames. If you prefer, you can opt for nonsynchronous, which will display every frame. The program uses an intuitive filmstrip metaphor that allows you to scroll through an entire movie frame by frame, making adjustments along the way.

Multimedia work is voracious when it comes to memory consumption. Even simple archives quickly swell to many megabytes in size. My swapfile grew by as much as 10MB while I browsed through a typical archive containing sound, 24-bit graphics, and small movies. MediaStation goes some of the way in dealing with this problem, supporting several different compression schemes, including JPEG, and automatically expanding compressed archives upon opening them. MediaStation supports virtual memory, and so the NeXT's mass-storage options, read/write optical disks, 2.88MB floppies, large-capacity hard drives, CD-ROM

MediaStation

An integrated multimedia database and authoring system that allows you to capture, store, process, organize, and present high-resolution graphics, scanned images, digital audio, video, animation, and text. The program is limited by the lack of a scripting language.

$995 single-user version

Imagine, 32 N. Washington St. #14, Ypsilanti, MI 48197. 313/487-7117.

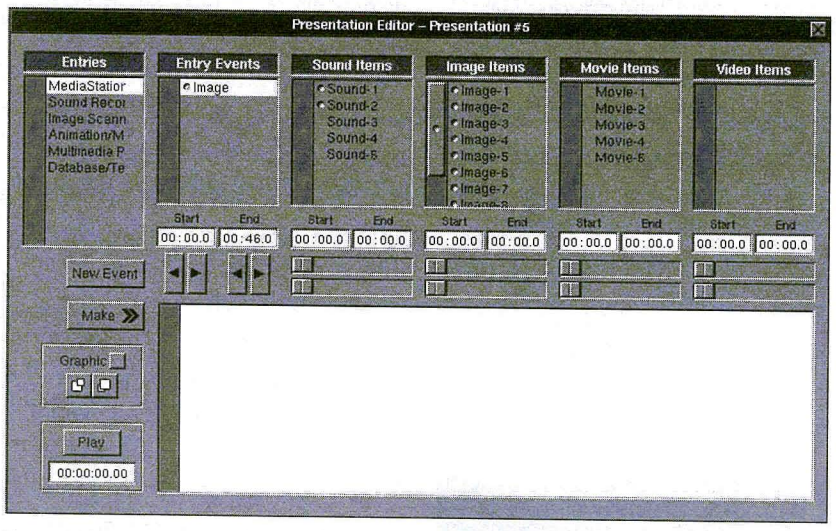
drives, and network file servers can do the rest.

Pulling it together

Once created, files can be added to the archive either by importing them via a menu command or simply dragging them in from the Workspace Manager. Text can be entered in scrolling fields within the archive or brought in from outside. You can attach files to buttons either by importing them via a menu command or again dragging them in from the Workspace Manager.

The gracefulness of the drag-and-drop technique is complicated by the need to first drag files into a buffer. The two-step approach, however, does allow you to preview sounds and graphics before committing them to your presentation; you can even pull off some minor tweaking in this intermediate stage. The buffer can also serve as a temporary storage area where you can experiment without destroying your original.

Using the Presentation Editor, you assign start and end times, measured in seconds, to the various events that make up your presentation. Several events can be played back simultaneously, allowing for some fairly complex animation.



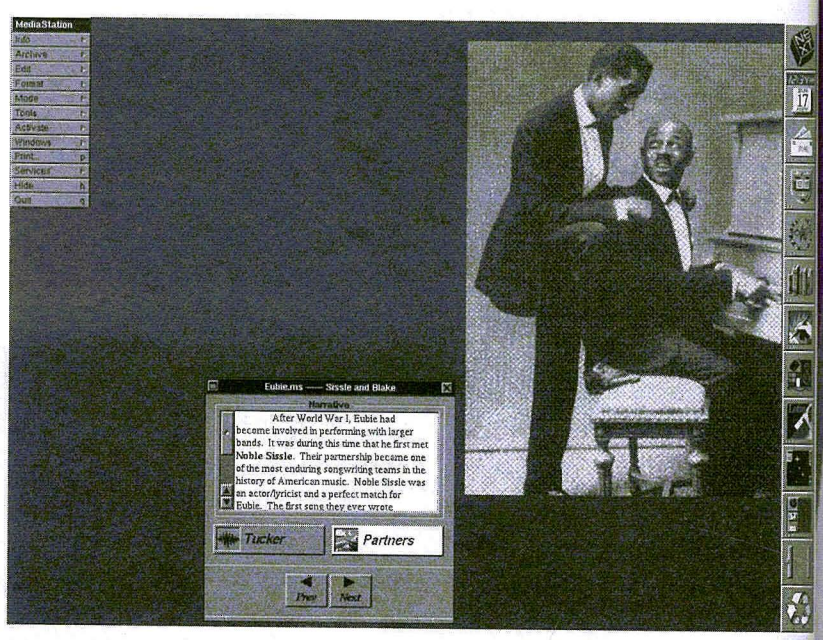
Presentations are controlled via MediaStation's Presentation Editor, where you can create events with assigned start and end times from the archive's items. Items with bullets have start and end times assigned.

The Presentation Editor generates a script that can be viewed either as text or as a time line similar to that found in MacroMind Director for the Mac. It can't be edited directly, however; changing the script is a matter of revising the archive design.

The direct manipulation of on-screen objects is a satisfying way to work, obviating the need for programming, but it does have its limitations. In HyperCard, the function of a button is dictated by the script contained within it. MediaStation's use of multiple button types is somewhat confusing, but necessary in a program that lacks a scripting capability. More seriously, MediaStation's lack of a scripting language limits its flexibility considerably, particularly when considered in terms of the NeXT's interapplication communication. Archives produced with the program tend to all look alike, with a set of standard buttons and a scrolling text field dominating the panels.

Tradeoffs

Despite the program's maturity in Version 2.0, a few nagging problems mar the package. Although the consistency of the different modes of the program makes it easy to learn, many aspects of the interface are less than intuitive. Its graphics controls are decidedly nonstandard and difficult to grasp. In addition, much of the terminology used throughout the program seems unnecessarily arcane, sounding like it was developed by a programmer rather than the artistically inclined, who will be drawn to this program. Commands like "Flip Color Space Value" have no place in a desktop program; "Invert" is the standard term.



A finished MediaStation archive has a standard look, consisting of a control panel with preset controls, from which sound, images, and other media can be launched by the user.

MediaStation's manual includes a series of comprehensive tutorials, and the program ships with an excellent demo archive that explains the basics of the program. The manual is also provided on-line in WriteNow format for searching with Digital Librarian. What's there is good, but a complex program such as this would benefit from an interactive on-line help facility – one with sound and video.

As a database, MediaStation offers title, text string, and keyword search options on the data included in its archives; keywords for internal files can be assigned by the author. It also provides a full range of report options. The program is fully network-capable, permitting simultaneous access to the same archive, and providing security features in excess of those provided by UNIX. Another advantage to the database approach is that presentations can be reused. You could, for example, create a self-running presentation for one audience and an interactive one for a different audience using the same files.

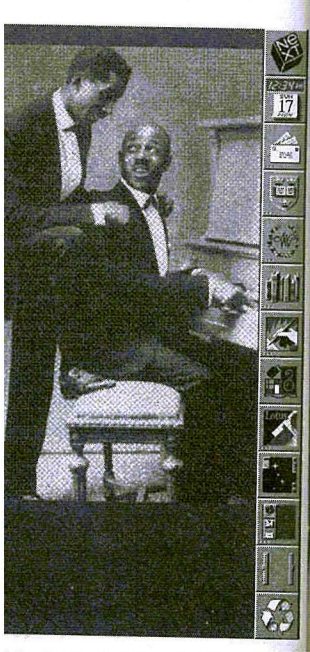
Despite its interface quirks, MediaStation fills an important role for NeXT software – especially with database managers, presentation packages, and authoring environments still in short supply for the platform. MediaStation succeeds in bringing multimedia to the masses. If HyperCube, due from Thoughtful Software in early 1992, arrives as expected, NeXT users should be able to choose between presentation flexibility and database functionality. Meanwhile, educators, presentation professionals, and artists who require video I/O or need to store vast quantities of multimedia information should be thankful for MediaStation.

LEE SHERMAN *is a writer and NeXT developer specializing in music and multimedia.*

SIMSON00000905

ations can be reused. You
or example, create a self-
presentation for one audi-
d an interactive one for a
t audience using the same

spite its interface quirks,
tation fills an important role
T software – especially



ng of a control panel with preset launched by the user.

base managers, presenta-
ages, and authoring envi-
still in short supply for
rm. MediaStation suc-
ringing multimedia to the
HyperCube, due from
ul Software in early 1992,
expected, NeXT users
able to choose between
on flexibility and data-
tionality. Meanwhile, edu-
esentation professionals,
s who require video I/O
store vast quantities of
ia information should be
or MediaStation.

ERMAN *is a writer*
T developer specializing
nd multimedia.

DOCTORS, ENGINEERS, GENERALS, TEACHERS,
LAWYERS, REAL ESTATE BROKERS, ETC.
USE MORE PRESENTATION SLIDES
EVERY YEAR.

'88 '89 '90 '91 '92

THIS SIDE TOWARD SCREEN

TALUS
IMAGING

The Rio™ Desktop Film Recorder from TALUS Imaging™ allows NeXT™ users to inexpensively create professional quality 35mm slides, Polaroid™ prints, pocket-sized overhead transparencies, and 35mm motion picture footage. The Rio Film Recorder sells for $6595 and comes complete with a 35mm camera back, a Polaroid instant film back, a NeXT interface kit, Imager™ software, user manual and 2-year factory warranty. The Imager software's intuitive interface means you do not need any special training to take any TIFF or EPS image from any file on the NeXT and output a 35mm slide that looks like it was made by a slide service bureau. The image-scaling feature enables you to enlarge any portion of a file to full 35mm frame size or reduce a full frame image to only a portion of the frame. With hardware resolution of up to 4096 by 3600 pixels, the Rio Rilm Recorder is specially designed to allow you to RIP the image from the built-in true Adobe Postscript™ interpreter that is built into your NeXT computer.



A 4x5 film back, automatic instant film back, 35mm motionpicture film back and a 35mm bulk-pack slide film back are also available. To place your order, or for more information about our English or International versions, contact us.

TALUS Imaging 11850 Riverview Way Houston, Texas 77077
Tel: (713) 556-6007 Fax: (713) 556-6258 Email: info@talus.com

Circle 34 on reader service card

© Copyright 1991 Talus Corporation. Rio, Imager and Talus Imaging are registered trademarks of Talus Corporation. NeXT is a registered trademark of NeXT Computer, Inc.
Polaroid is the the registered trademark of the Polaroid Corporation. Adobe and Postcript are registered trademarks of Adobe Systems Incorporated.

Office Manager In a Box

Adamation's Who's Calling provides a total client-management system

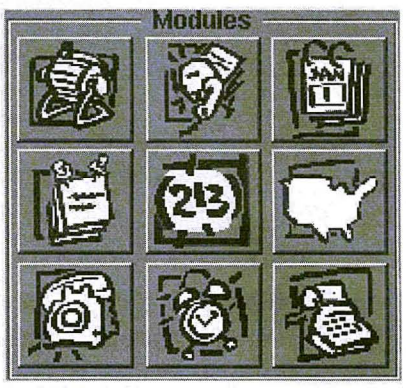
by FRANC GARCIA

Everybody would love to have a personal secretary. But since a software substitute may be as close as some of us will ever come, Adamation's Who's Calling 2.0 is a welcome arrival to the NeXT environment.

Designed to help sales professionals – or anybody who deals with lots of clients and colleagues – keep track of calls, messages, and appointments, Who's Calling is described by its creators Stephan and William Adams as a "fully automated client-management system." And despite some minor flaws, Who's Calling delivers on this promise. It offers more than the average database and is easier to use.

Who's Calling differs from flat-file databases like Stone Design's DataPhile in that it is relational, built on top of Ingres (with Oracle and Sybase versions available). But Adamation has foregone many of the formatting and customization features generally available in database packages. Likewise, Who's Calling differs from both flat-file and relational database front ends by offering a full suite of scheduling, call-tracking, and organization tools designed to be shared by users on a network.

What's new about Version 2.0? The upgrade includes interface changes, a host of new features, and better documentation. According to its creators, "If you haven't used Who's Calling 2.0, you haven't used Who's Calling."



A series of modules offers a suite of scheduling, messaging, and organizational tools.

A modular approach

Who's Calling is organized into four modules: a Contact Database that includes the list of clients and client information; a Message Board, where detailed messages between users are sent and received; a Conversation Manager, which keeps track of client conversations and automatically schedules callbacks to those clients; and a robust Calendar, which in itself is a full-featured organizational tool that can be shared over a network.

The Contact Database is the reference point for all the modules. It contains preset fields, such as Name and Address; a scrolling view where custom fields can be added; and an unlimited capacity for telephone numbers per client record. A Client List is available to view, sort, and query all clients at once. In fact, it is only through the Client List that individual records can be selected for viewing in the Client Database.

Reports and mailing labels can be automatically generated from this module as well. These reports have a preset format that is relatively straightforward. But, like the Contact Database and other information, the reports cannot be customized.

In the Client List, users can search for any client or list of clients using any combination of the 15 commonly used preset fields. Wildcard queries can also be performed. These fields – which cover almost all the information you would need about a client – are convenient for salespeople who find it bothersome to have to customize their database, but the fact that these fields cannot be edited makes Who's Calling cumbersome at times. In addition, custom fields also can't be added to the Client List view, so the Contact Database will not be able to sort records according to the information a user might want them to contain.

Another part of the Contact Database module is the Media Well, a repository of multimedia files for each client record. It allows users to link several of any types of files or directories to individual records. By double-clicking the Media Well, linked files are displayed in a list, from which they can be opened. TIFF and EPS images, letters, or faxes can all be displayed in the Well if desired.

One minor problem exists, however: If a linked file is moved to a different location in the file system, Who's Calling will not display it in the Media Well the next time another user in the workgroup attempts to access it.

Who's Calling 2.0

Designed to help anybody who deals with lots of clients and colleagues keep track of calls, messages, and appointments, Who's Calling 2.0 offers a full suite of scheduling, call-tracking, and organization tools. The upgrade includes interface changes, a host of new features, and improved documentation. Despite some minor flaws, it offers more than the average database and is easier to use.

$495, single user version

Adamation, 1435 Center St., Oakland, CA 94607. 415/452-5252.

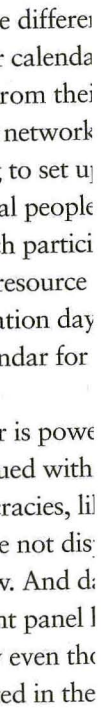
Integrated applications

The second module, the Message Board, allows users to send detailed messages from callers to other users on a network. It differs from NeXT e-mail in that the messages are live, and sent immediately, rather than stored in a queue. And they are sent to a user's machine, no matter where that user is currently logged in on the network, so that each user's Message Board updates correctly and efficiently. At the end of the day, a report of received messages can be printed for easy review.

A User List is also available for quickly addressing messages, so a receptionist, for example, can send a written or recorded message to a number of people simultaneously by simply clicking names rather than having to type names or addresses.

Logging and organizing phone conversations is done in the Conversation Manager. In addition to logging calls with voice annotations, users can schedule callbacks to clients. The Who's Calling tickler, an alarm panel that even has a snooze option, will remind them of a scheduled call even if they are in another program or if Who's Calling isn't running. Users can automatically print conversation lists and phone logs, as well as post scheduled callbacks to the Calendar.

The Who's Calling Calendar is a separate application integrated into the main program. The Calendar provides three levels of detail: the Calendar view; an Agenda pane into which events and reminders are listed; and an Event panel, into which information is entered. The Calendar can be viewed in month, week, and day views. The month view takes up most of the NeXT screen, so it can be read easi unlike the Calendar app tha with the NeXT. The six-mo day views are also ample in Items in the Calendar are ca rized as phone calls, remind appointments, or reservatio any combination of these ca displayed in any of the view example, a user can filter out anything but reservations and/or reminders for a view or time period.



The Con preset fi

Resources, one of the most powerful features of the Calendar module, will be especially useful for workgroups. A Resource, which can be thought of as a simple file representing a person or category, is defined and contains the info for a particular calendar. A dar can then merge differe mation from other calenda resources, either from thei lists, or across the network example, in trying to set u ing between several people simply choose each partici the network as a resource pull up a combination day of this group calendar for lar day.

The Calendar is powe but it is also plagued with interface idiosyncracies, lil that to-do lists are not dis the Calendar view. And d edited in the Event panel l entered manually even th are already selected in the or week view.

Who's Calling 2.0 als general features that mak to use than previous versi is especially important in settings where temps hav up and running quickly o

SIMSON00000906

Z0600000NOSWIS

's Calling will not display
Media Well the next time
ser in the workgroup
:o access it.

ted applications

ıd module, the Message
.ows users to send detailed
from callers to other
ı network. It differs from
nail in that the messages
nd sent immediately,
ın stored in a queue. And
ent to a user's machine,
: where that user is cur-
ged in on the network, so
user's Message Board
orrectly and efficiently. At
f the day, a report of
nessages can be printed for
w.
er List is also available for
ddressing messages, so a
ist, for example, can send
or recorded message to
: of people simultaneously
clicking names rather
ng to type names or
:.
ging and organizing phone
tions is done in the Con-
Manager. In addition to
alls with voice annota-
rs can schedule callbacks
. The Who's Calling
ı alarm panel that even has
option, will remind them
duled call even if they
other program or if Who's
sn't running. Users can
ically print conversation
phone logs, as well as
eduled callbacks to the
:
Who's Calling Calendar is
e application integrated
main program. The Calen-
ides three levels of detail:
ıdar view; an Agenda panel,
ch events and reminders
; and an Event panel, into
formation is entered. The
: can be viewed in month,
d day views. The month
es up most of the NeXT

screen, so it can be read easily, unlike the Calendar app that ships with the NeXT. The six-month and day views are also ample in size. Items in the Calendar are categorized as phone calls, reminders, appointments, or reservations, and any combination of these can be displayed in any of the views. For example, a user can filter out anything but reservations and/or reminders for a view or time period.

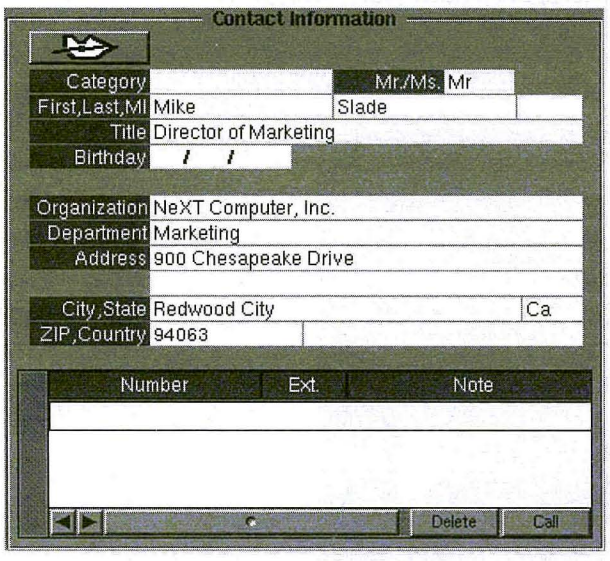
Resources, one of the most powerful features of the Calendar module, will be especially useful for workgroups. A Resource, which can be thought of as a simple file representing a person or category, is defined and contains the information for a particular calendar. A calendar can then merge different information from other calendars or resources, either from their own lists, or across the network. For example, in trying to set up a meeting between several people, you can simply choose each participant on the network as a resource and then pull up a combination day view of this group calendar for a particular day.

The Calendar is power-packed, but it is also plagued with some interface idiosyncracies, like the fact that to-do lists are not displayed in the Calendar view. And dates being edited in the Event panel have to be entered manually even though they are already selected in the month or week view.

Who's Calling 2.0 also offers general features that make it easier to use than previous versions. This is especially important in corporate settings where temps have to get up and running quickly on software they've never used. For example, voice alerts for deleting, saving, finding, and updating guide the user through the program. These can be turned on and off through the preferences panel.

Good safety net

Who's Calling still lacks some important features. For example, the database has very little in the way of formatting capabilities. It also lacks the ability to automatically fill in information based on keywords for a client from a linked reference file. And custom fields can't be added to the Client List.



The Contact Database is the reference point for all the modules, with preset fields as well as a scrolling view for adding custom fields.

Another area that needs improvement is the interface, which is cluttered and cumbersome. Sort Order, for instance, is not saved in the Client List. In the Conversation Manager, you must use the mouse to move from the first field rather than the Tab key.

The program keeps track of a lot of detail, but it also requires the user to enter much of it in a manner that can be tedious, like relying on the mouse.

And aside from the voice alerts mentioned above, Who's Calling lacks a good on-line help system. Luckily such a system – purportedly as good as Improv's – is under development for Version 3.0.

Among the other enhancements scheduled for Version 3.0 is a Report Creator with customization features. Presently, reports are limited to a preset format that can't be changed. The program is also expected to be unbundled, so that each module can be purchased separately.

Installation of Who's Calling, though easier than earlier versions, is still difficult for networked users – which is ironic since the program is built for use on a network.

Who's Calling is a good idea that's well developed but still needs work. For the sales professional on the verge of buying another case of Post-It pads, it's a great tool – once you master all its idiosyncracies. At the very least, it's a good safety net to catch those calls and appointments that would otherwise fall through the cracks.

If you tried Who's Calling in its first permutation and got overloaded by one too many windows, you should try Verison 2.0. There's enough improvement to merit another look.

FRANC GARCIA *has worked at Apple Computer and NeXT, and is currently channel marketing manager at Voyager Co., in Santa Monica, California.*

Imagine
MULTIMEDIA

Makers of MediaStation®, the world's leading UNIX® multimedia authoring system. See the MediaStation® product review in this issue of *NeXTWORLD*.

Imagine Multimedia, Inc. 44 Frank Lloyd Wright Drive P.O. Box 473 Ann Arbor, Michigan 48106
313-930-7777 313-930-7776 (fax) Email: sales@imagine.com

Circle 27 on reader service card

DataPhile 1.0

Barlow: I'm not sure it's ethical for me to pump a product in whose credits I'm listed, but then I've always considered objectivity to be a journalistic myth anyway. Besides, I would think DataPhile was a real piece of work even if I hadn't had a minor hand in designing it.

DataPhile, which should be on sale by the time you read this, is a very powerful flat-file database – the same sort of thing as FileMaker Pro for the Mac, but better in a variety of ways. It's the brainchild of my favorite software engineer, Andrew Stone of Stone Design in Albuquerque, and his associate Kris Jensen. Another guy who had a lot to do with it is Steve Jobs.

With his usual mania for detail, Jobs criticized DataPhile from button to field. His microscopic nitpicking so rattled Stone that he completely redesigned the interface – generally improving it – just to get a little peace. This is why great things have a way of appearing in the general vicinity of Steve Jobs. I would guess that John Sculley doesn't personally supervise the work of minuscule third-party Mac developers.



On one level, DataPhile is just meat and potatoes. It does all the usual database stuff – labels, reports, envelopes, invoices, inventories, lookup tables, and calculated fields. In these areas, it differs only in the ease with which it does them.

But DataPhile also has more bells and whistles than a Spike Jones record. It can store sounds and graphics, even loading a picture's mother program with a double-click on its field. Any text field can include unlimited scrollable Rich Text. You can voice-annotate both records and fields. It includes many of Create's drawing tools, which means you can make the fanciest reports and screen views imaginable. Indeed, any view can be a report.

What's missing? A few things. It's not yet a real interpersonal computing product in that it has file-level rather than record-level locking. In other words, only one person can have write privileges on a database at any given time. The company says this will be corrected in the second version. The other omission is the absence of summary fields. This is a real problem in making reports but is also due to be corrected. The work-around for now is exporting the data into Improv (an easy operation) and summarizing it there. Finally, I want it to dial my phone, but that may be asking a bit much.

In any case, DataPhile fills a gaping hole in the NeXT software suite. Today, there is certainly no doubt that it is the greatest flat-file database available for the NeXT. I think it will go on holding that distinction even after it's got some competition.

Lavin: *I may be the wrong guy to make a judgment on DataPhile, since I'm the sort of database jock who has been perfectly happy keeping his contact data in WriteNow files and using the Find panel to search it. This new product has me jumping for joy. For a guy who needs to keep data together, sort it, and report it every so often, DataPhile is great. I know it does a lot more, but those are my needs and I'm grateful this program fills them so ably.*

The only question is why it took so long to get a database of any sort on this platform. Now there's light at the end of the tunnel.

Concurrence 1.0

Lavin: For those of you who have known and loved presentation packages on other platforms, get ready for another reason to buy a NeXT. Concurrence is a combination outliner/presentation product from Lighthouse Design. It has the outlining power of [the old] More for the Mac, combined with the presentation power of Persuasion from Aldus, only it does them both one better.

The outliner is first class. It supports the NeXT environment, working well with other applications. It lets you rearrange thoughts on the fly. The outliner and the slide viewer are dynamically linked; changes in one show up in the other. In fact, different views of the same outline can result in different presentations, all linked together, or "in concurrence," as Lighthouse puts it. The slide viewer makes gorgeous slides. This is partly the NeXT and partly Lighthouse, but who cares?

Concurrence's only drawback is that in the rush to market, many important features will be missing until the next version comes out months from now. The feature set is a little wooden, though it's 100 times more flexible than its competitors on other platforms. So Concurrence is like a Ferrari Testarossa 1.0: Amazing, but still a 1.0. Buy it and upgrade.

Barlow: *Right again, Dan. If corporate presentations are a prominent feature of your blighted life, Concurrence is worth the price of a NeXT all by itself. It's that much better than any of its competition.*

I'm one of the last public speakers left in America who doesn't use overheads or slides. Concurrence may change all that. This program is powerful, deep, elegant, and easy. Its outliner is also about the best I've seen. I especially like its ability to maintain several different formats of the same material, updating them all simultaneously.

It's what one does with those outlines that might be problematic. Lacking such things as headers and page numbers, it's not quite a word processor by itself. And if you try to use it as the outliner WriteNow lacks, you run into trouble. You can't paste RTF text into WriteNow, so copying your beautiful Concurrence document over to WriteNow results in the loss of all formatting.

That the blame for this difficulty is WriteNow's, and not Concurrence's, doesn't make it better. The eager lads at Lighthouse are going to fix it as best they can, by allowing documents to be saved in RTF format. In any event, Concurrence is further evidence that there's more creativity among the handful of NeXT developers than can be found in the entire DOS world.

PHOTOGRAPH BY VOLDI TANNI

NeXT

Lavin: There has been storage pricing from NeXT unconscionable $2995, co lowest price reseller found than any other? No. The c guarantee. But memory is branded memory is like bu What's the point?

NeXT charges so muc the basic hardware that it minimally configured cost of memory it costs $29,29 could build an equivalent half the NeXT total.

I support NeXT's mai I see a better way. The unf that many machines go ou machines sit on people's d they aren't as fast or as pc needs to continue to achie machines interferes mighti configurations leave many to remove from their mini 4MB SIMMs.

My suggestion is that premium. The net would from NeXT. More import the best they can be.

Barlow: *Dan, I can't storage pricing. I just can' or actually immoral. Why form, such a spectacular b on items easily available e of the things that might b*

Barlow: When I first lightweight memo genera time professional writer li before reaching this asses

Now that WriteNow uct from Appsoft, I figure like it! My initial dim opi with what I paid for it. In written entirely in assemb WordPerfect's. It's also in manual in order to write

I miss a few things. I matic numbering and ren

SIMSON00000908

60600000NOSWIS

NeXT Memory/Storage

Lavin: There has been a lot of discussion lately about memory and storage pricing from NeXT. For 16MB of memory NeXT charges an unconscionable $2995, compared to $600 – one-fifth the price – from the lowest price reseller found by *NeXTWORLD*. Is NeXT memory better than any other? No. The only advantage is that it's backed by NeXT's guarantee. But memory is so much a commodity product that buying branded memory is like buying a genuine GM gas cap for your car. What's the point?

NeXT charges so much because it's shaved its margins so thin on the basic hardware that it hopes to make it up on add-ons. A NeXTcube minimally configured costs $7995, but with two 1.4GB disks and 64MB of memory it costs $29,295. Most of that is profit, since a sharp consumer could build an equivalent system with third-party products for $14,195, half the NeXT total.

I support NeXT's march into profitability as much as anyone, but I see a better way. The unfortunate net result of high-priced peripherals is that many machines go out "lighter" than they might otherwise. These machines sit on people's desks, where other people try them out to find they aren't as fast or as powerful as a "heavy" machine would be. NeXT needs to continue to achieve critical mass, and a legion of underpowered machines interferes mightily with this goal. Worse, substandard memory configurations leave many users with useless 1MB SIMMs that they have to remove from their minimally configured machines to make room for 4MB SIMMs.

My suggestion is that NeXT price its memory and storage at a modest premium. The net would be the same profit, since more people would buy from NeXT. More importantly, the machines would go out into the world the best they can be.

Barlow: *Dan, I can't fault a word you say about NeXT's memory and storage pricing. I just can't decide whether it's monumentally boneheaded or actually immoral. Why on earth make this great computer, in its bare form, such a spectacular bargain, and then charge a 600-percent markup on items easily available elsewhere? Beats me. And I'm afraid it's one of the things that might beat them.*

WriteNow

Barlow: When I first got my NeXT, I dismissed WriteNow as a lightweight memo generator insufficient to the industrial needs of a big-time professional writer like me. Frankly, I didn't look at it very hard before reaching this assessment. It was a judgment of blind prejudice.

Now that WriteNow has come unbundled and is a commercial product from Appsoft, I figured I ought to give it a real chance. And, hey…I like it! My initial dim opinion of WriteNow probably had something to do with what I paid for it. In fact, WriteNow is lean, clean, and mean. Being written entirely in assembler, its screen response is a great deal faster than WordPerfect's. It's also intuitive enough that I only bothered to read the manual in order to write this review.

I miss a few things. I desperately long for both outlining and automatic numbering and renumbering capabilities. I wish it had style sheets, though its Shift-formatting makes it possible to format all the paragraphs of a certain type in a document even if they're not contiguous. It doesn't have wraparound graphics (but neither does Word for the Mac). I would like to be able to insert graphic lines and paragraph borders. It would be nice if the auto-inserted date could be formatted in some other style than the very nerdy "Tue Sep 10 1991." And if part of a document is in multiple columns, it all must be – which means that columns are fairly useless.

But that's about all that's wrong. Most everything else is there, from merge mail (which, unlike WordPerfect, follows a standard fashion) to footnotes. It does most of what I want it to with crisp dispatch. With a few modest feature enhancements, this could be as good a word processor as there is.

Lavin: *Hating WriteNow is pretty much required in this community, John, like hating lawyers is in some circles. In the past, I've generally shared that low opinion, but this review has begun to change my impression. I just have to determine whether my conversion is from three years of use or the presence of any truly redeeming qualities.*

There is much to like about WriteNow, but the handling of graphics is still truly poor. It doesn't know about the Colors panel. Your points are well taken, John, but this at-least-three-year-old program does not yet work like a NeXT program should. Now the able team at Appsoft has taken over the product and has promised many improvements. I believe them, but for this product at this time I have to withhold my approval – and my thumb.

Copy-Protection Schemes

Lavin: I can't believe we're addressing this problem in the 1990s, John. This fight was fought and presumably won in the early '80s. But now several well-meaning third-party developers, in the name of protecting their investment, have brought the evil of copy protection back from the grave.

In a nutshell, copy protection inconveniences all of a vendor's customers so a losing battle can be fought against some pirates. It's a losing battle because all of these schemes can be broken by the determined pirate, leaving honest customers with aggravation and system administration problems.

Following is my copy-protection Hall of Shame.

Mathematica: This great company with great people has the most restrictive licensing policy on earth. Each user of Mathematica must physically call Wolfram Research on the phone and give them information about a specific machine in order to receive a license that only will work on that machine. In other words, if you go to the store and buy a product, you're still a phone call away from using it. Worse, this arrangement defeats the key network capabilities of the NeXT. If you own ten machines and want to own three licenses because only three machines will be using Mathematica, you must choose – and carve in stone – which machines they'll be.

Lighthouse Design, Sybase, Frame Technology: These folks use a scheme that checks to see how many copies of a program are running on a network, and refuses to launch another process if the number is too large. Though reasonable on the surface, I don't like programs running around my network checking up on things. I've seen at least one of these schemes fail, to everybody's aggravation.

These vendors also use hot branding, practiced as well by many vendors, including Stone Design, enTAR, Visus, RightBrain, and HSD. This process places your registration info deep into the program's binary, making tracking bogus copies easy. Some of them will not even run until registration is completed with a valid registration number. This method is prone to problems when software is sold or if the little slip of paper is lost after a hard disk crash.

Copy protection assails the mutual trust that software licenses are built upon. The software license system is in essence a voluntary compliance system, and customers distrusted by their vendor may just live up to expectations. Beyond that, copy protection assails the basic expectation that software will help make your life easier and improve your productivity.

Barlow: *Given that I spend a fair amount of time going around speaking on the oxymoronic quality of the phrase "intellectual property," I'm surprised to find myself in mild disagreement with you on this, Dan.*

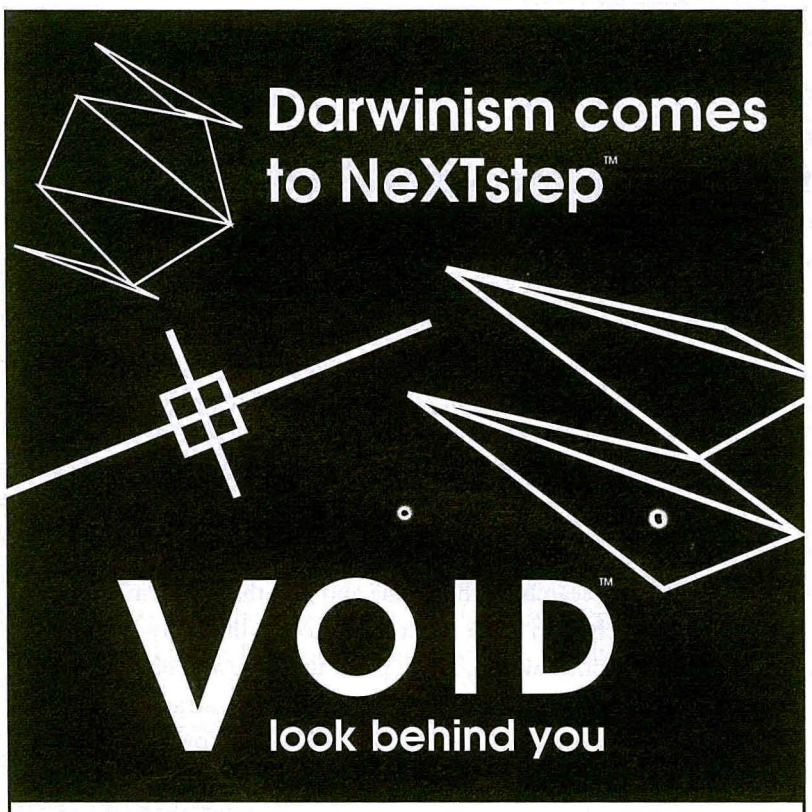
It's not that I think copy protection makes sense in general. Information, unlike, say, gold or real estate, doesn't necessarily diminish in value with increased abundance. Indeed, you could make a case that the reason Lotus continues to maintain itself as the Iron Standard of spreadsheets has a lot to do with 1-2-3 being the most pirated software in the world. The fact that perhaps the majority of software on people's hard disks (if not in actual use) is pirated has not kept the software industry from becoming the most robust sector of the American economy. Sooner or later, if it's getting used, it gets bought.

To be realistic, however, you have to recognize that given the minute scale of the NeXT software market, 100 pirated copies of a program cou constitute its developer's entire profit margin. Add to that the incredible ease with which we can transfer software through NeXTmail and the fac that a high percentage of NeXTs are in academia – where actually buying software is considered bozo behavior – and you've got a problem.

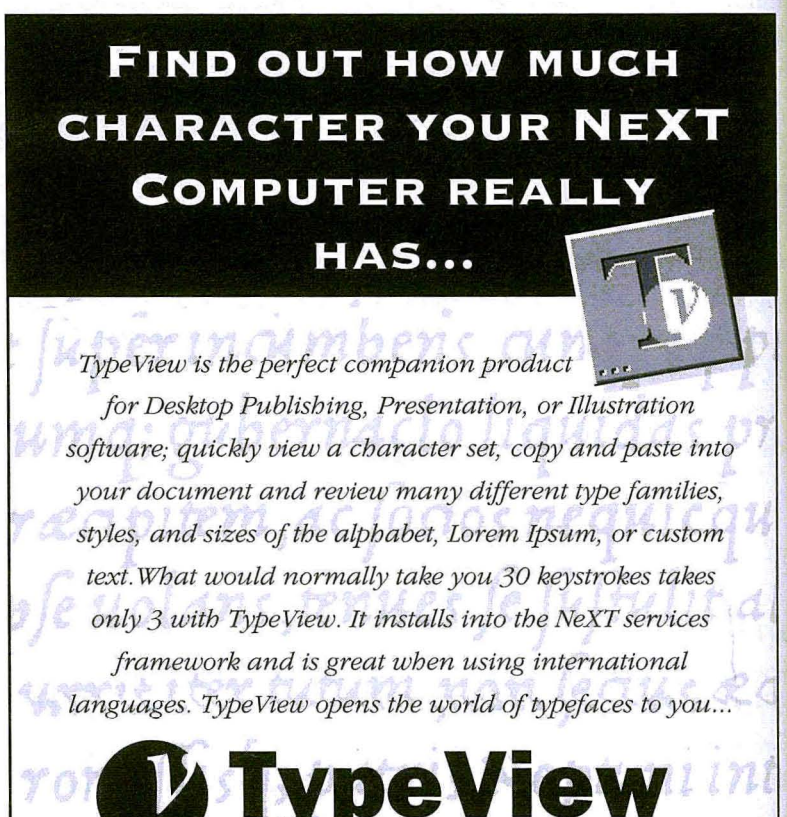
So I guess I regard some copy protection as a necessary evil until we' reached an economy of scale here. But there's copy protection and copy protection. The forms employed by companies like Stone Design and Lighthouse are pretty innocuous. They're never going to cause a backup copy to self-destruct. But the bureaucratic labyrinth that guards Mathematica is genuinely stupid.

Mild copy protection for struggling NeXT developers:
Savage copy protection for Mathematica:

Will JOHN PERRY BARLOW *make the plunge into slides? Wi* DAN LAVIN *make up his mind about WriteNow? Check out their live Barlow & Lavin performance at NeXTWORLD Expo. Or send them e-mail at: jbarlow@nextworld.com and dlavin@nextworld.com.*



Circle 31 on reader service card



Circle 36 on reader service card

No Toast

With the incre
ity and expe
desktop con
plays, screer
utilities have
a significant software cate
the Macintosh and Wind
forms. There are several r
why they are even more ir
on the NeXT. First, unlik
PCs, NeXT machines are
left on 24 hours a day. Th
Application Dock and me
tions of the screen are alw
very often with exactly th
items in the same position
MegaPixel and MegaPixe
Displays are expensive to

The main rationale fo
savers is to prevent burn-i
which the screen's phosp
become stuck on a given i
ducing permanent ghostir
location. Also, phosphors
prolonged use, so screen s

Typophile

Think of TypeVie
big font inspect
ing a plethora o
and informatio
your system's in
typefaces. You can find o
holds the copyright to the
what keystrokes to use to
members of the extended
set, and what kerning pai
for the font. Or you can s
your ad slogan, or a few li
dummy text, looks like in
of different types and size

You can also think of
as a workshop in which t
and choose type. You can
find and style any charact
installed font, viewed at a
to the full area of your scr
cut and paste that styled c
into another application w

SIMSON00000910

SIWSON00000911

No Toasters?

With the increasing quality and expense of desktop computer displays, screen-saver utilities have become a significant software category on the Macintosh and Windows platforms. There are several reasons why they are even more important on the NeXT. First, unlike many PCs, NeXT machines are frequently left on 24 hours a day. The NeXT Application Dock and menu portions of the screen are always used, very often with exactly the same items in the same positions. Also, the MegaPixel and MegaPixel Color Displays are expensive to replace.

The main rationale for screen savers is to prevent burn-in, during which the screen's phosphors become stuck on a given image, producing permanent ghosting in that location. Also, phosphors fade with prolonged use, so screen savers can go a long way toward keeping colors crisp and screens bright.

NeXT addressed the burn-in problem with its built-in dimming, but without any options for changing screen-saver displays. Several public-domain screen savers are available in the Internet archives.

Now, RightBrain Software has produced the first commercially available screen saver for the NeXT. It does the job, preventing burn-in by putting a pattern on the display after an adjustable time period. Users can choose to display the time and date the machine was locked, the current date and time, a user-selected message or graphic, or words randomly selected from the dictionary.

While this last option is interesting, providing thought-provoking combinations of words that look great on a color display, LockScreen's visual displays do not measure up to the standard of fun set by After Hours in the Mac market, home of the flying toasters.

Beyond simple screen saving, LockScreen also provides system security through its screen-locking features. When invoked, a user must enter his or her password to remove the screen saver and access the computer. Advanced features are available to keep a log of failed attempts to enter the password and to allow system administrators access to a locked system even if they are not the currently logged-in user. A voice option allows the user to leave a voice message that can be played from a locked machine.

LockScreen's user interface is clean, and the screen-saver options offer subtle and sophisticated touches. The advanced features give needed control to administrators in large environments. RightBrain provides detailed documentation on disk that covers all aspects of the program. Technical support is toll free and free of charge.

While there are shareware alternatives to LockScreen, RightBrain contends that screen savers on the NeXT can interfere with the Display PostScript server if not implemented correctly. RightBrain pledges to support the product, improve it, and fix bugs. For commercial users who do not want the uncertainty of unsupported software, LockScreen's low cost may make it a standard on every NeXT workstation. We recommend it, though we'd like to see more fun options added to the elegant implementation already present.

by DAN LAVIN

LockScreen

An elegant screen saver/locker. Works flawlessly, and is well supported, but could use some more fun options in addition to the great ones already present.

$59

RightBrain Software, 132 Hamilton Ave., Palo Alto, CA 94301, 415/326-2974, 800/472-7246, 415/326-2977 fax.

Typophile's Toolbox

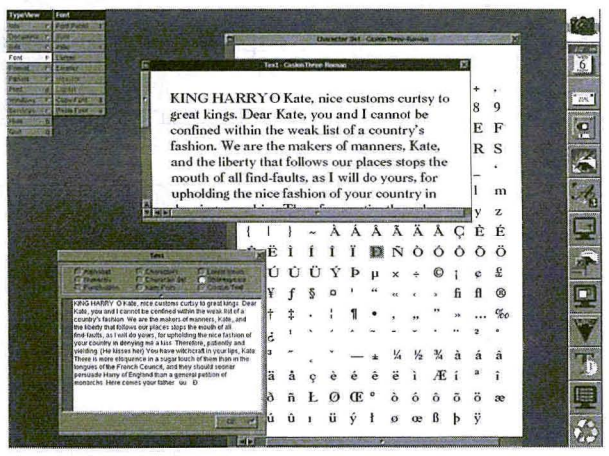
Think of TypeView as one big font inspector, supplying a plethora of views and information about your system's installed typefaces. You can find out who holds the copyright to the font, what keystrokes to use to access members of the extended character set, and what kerning pairs exist for the font. Or you can see what your ad slogan, or a few lines of dummy text, looks like in a number of different types and sizes.

You can also think of TypeView as a workshop in which to view and choose type. You can use it to find and style any character in any installed font, viewed at any size up to the full area of your screen, then cut and paste that styled character into another application where viewing fonts is not so easy.

Vivid Software describes its program as "an aid to help you understand and appreciate the subtleties of type and typeface." The description points out both the strengths and weaknesses of the program. It's a cornucopia of system-enhancing features, but it doesn't offer any single can't-do-without-it feature. It's not really built with a real-world application in mind.

TypeView's designers see TypeView's audience in two main groups: designers and everyone else. Designers will use TypeView to easily view and choose typefaces for layouts and presentations. Everyone else will use TypeView's Character Set view to easily access a font's extended character set, which includes everyday characters such as the fraction ½ and the foreign-language characters necessary to NeXT's overseas audience.

The Character Set view is TypeView's main window and the tool for navigating through a font. The every-letter-for-itself layout takes a little getting used to, but if you look on it as a giant character menu rather than a font display, the choice of layout becomes more understandable. From here, you can select specific characters or →



TypeView offers several views of any typeface installed on your system. The Character Set panel (in background) is TypeView's main window. You can view any font or set of fonts in several texts, including this, from Shakespeare's *Henry V*.

TypeView

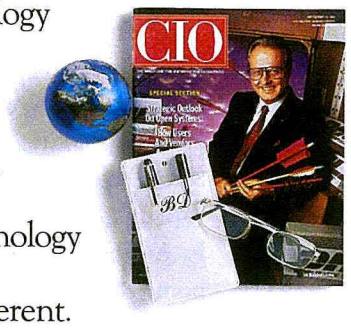
A multipurpose "font inspector" with cut-and-paste capabilities. TypeView provides several views on any font installed in your system, then lets you cut and paste the type into another application. Casual users of type will get the most use out of the "Key Caps" feature; designers will like the ability to easily test out a variety of typestyles.

$129; site licenses available, 50 percent educational discount

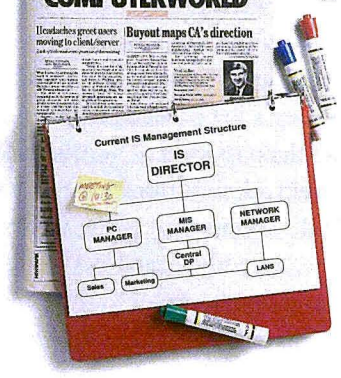
Vivid Publishing, P.O. Box 0271, Los Altos, CA 94023, 415/949-4933.

If there were only one kind of computer buyer, we'd only have one computer publication.

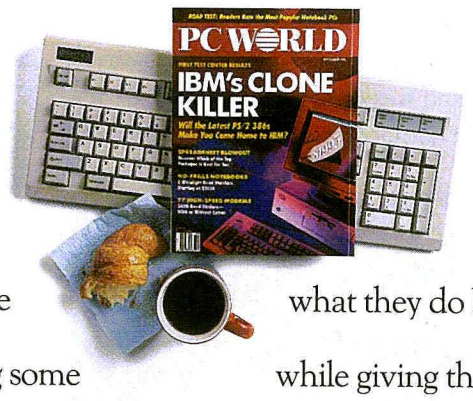
These days, technology has to serve everybody. The trouble is, everyone wants technology to do something different.



IS managers, for instance, are apt to put a very strategic spin on things. That's because they're charged with delivering information throughout the enterprise, integrating the company's computing and communications resources.

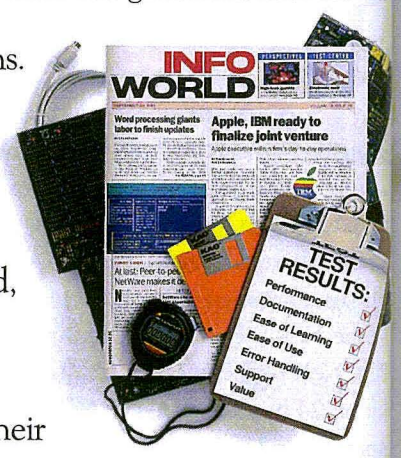


CIO's tend to look at the whole enterprise another way.

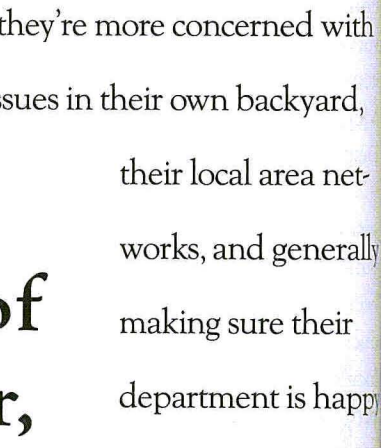


After all, they're tackling some of the very trickiest issues in business. Like how to best use technology to produce the greatest business management gains.

Department managers, on the other hand, have to focus on doing just what their name implies. So they're more concerned with the productivity issues in their own backyard, their local area networks, and generally making sure their department is happy and humming along.



End users, however, have a different perspective entirely. They see the world from their desktop. They want whatever helps them do what they do better—while giving them access to the rest of the workgroup or a mainframe.

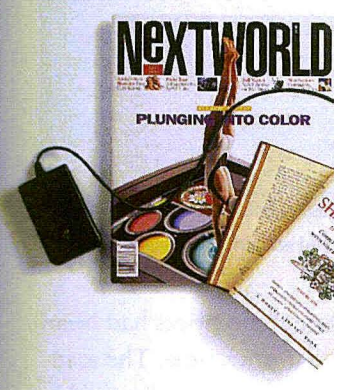




competitive advantage

The point is, eve

body's involved. All these groups influence each other. That's why, today, there's no one person who's responsil buying technology for



for buying and implem

responding to different



SIMSON00000912

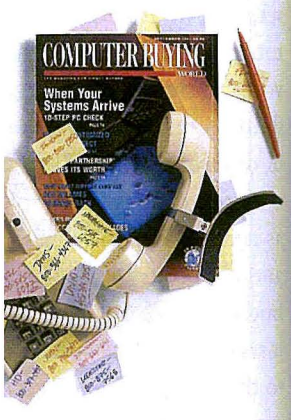
SIMSON00000913

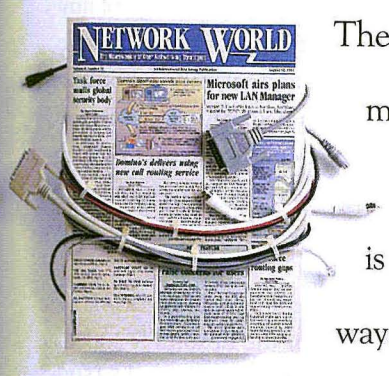
greatest business



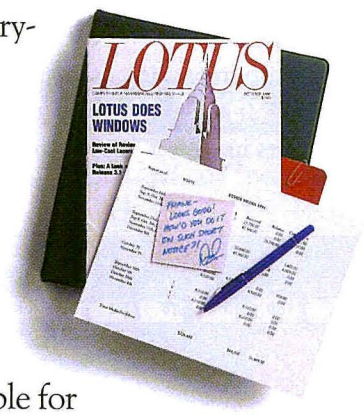
nore concerned with heir own backyard, their local area networks, and generally making sure their department is happy and humming along.

End users, however, have a different perspective entirely. They see the rom their desktop. nt whatever helps

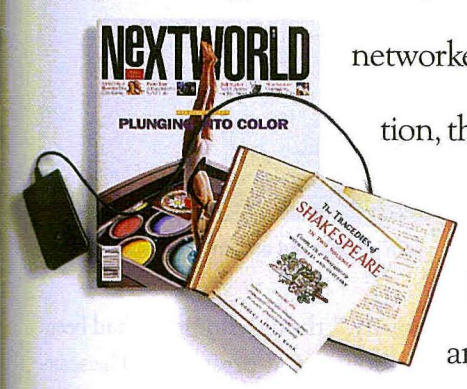




Then there's senior management. To them, technology is one of the best ways to gain a strategic, competitive advantage. Or, at least, it better be.

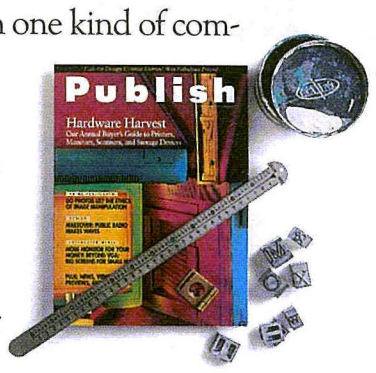


The point is, everybody's involved. All these groups influence each other. That's why, today, there's no one person who's responsible for buying technology for the many. Instead, in the networked corporation, there is a network of people who are responsible for buying and implementing technology, each responding to different needs and demands.

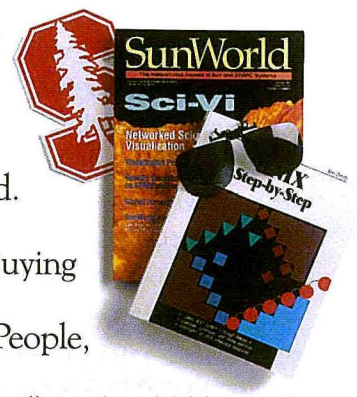




That's why they all need different kinds of information, presented in different ways, to help them do their jobs. And why we have more than one kind of computer publication.



In fact, IDG has more ways to reach more of your market than anyone. We also know more than anyone about how information technology is bought, having just completed the largest independent study of the buying process ever conducted.



It's called, "Buying IT in the 90s: The People, Patterns, and Process." And we'd like to share it with you. Just call Erica Baccus, our V.P. of Marketing, at 1-617-534-1210, for a free copy of the Executive Summary.

And find out why nobody knows more about how to reach more of your market than we do.



IDG
INTERNATIONAL DATA GROUP
The World of Information Technology

© 1991 International Data Group, 1 Exeter Plaza, Boston, MA 02116, 1-617-534-1200.
Brand or product names are trademarks or registered trademarks of their respective holders.

→ Typophile's Toolbox

move to other views. Selecting a character here blows it up in a window that fills about half your screen, where you can apply styles and manipulate it to your heart's content. Then you can cut and paste it into another application (styles intact, if the target program supports the RTF pasteboard), or you can view it in outline mode, which shows the bezier control points but is not editable.

More information about fonts is available through TypeView's Panel command. The Text panel lets you choose specific text to view, including the font's numerals, the famous Lorem Ipsum dummy text, the love scene from Shakespeare's *Henry V,* or text of your own. An Inspector panel shows the kern pairs for the font, the font's copyright owner and version, among other information. The Font panel is an enhanced version of NeXTstep's standard Font panel; it lets you choose several fonts and sizes instead of just one to view your text in. The Keyboard panel has a Key Caps-like interface that displays the characters assigned to each key, in the standard mode and with the Alternate and Shift keys pressed. All TypeView's features are available through the Services menu in other programs.

As varied as TypeView is, most of the features it offers are already available within any text-editing program on the platform, thanks to the NeXTstep Text object on which most applicatons are built. There's no argument that TypeView makes viewing some effects easier than in other programs, but that ease, and the nice but non-essential new features it offers, may not be compelling enough to justify the $129 price for some users.

by DARCY DINUCCI

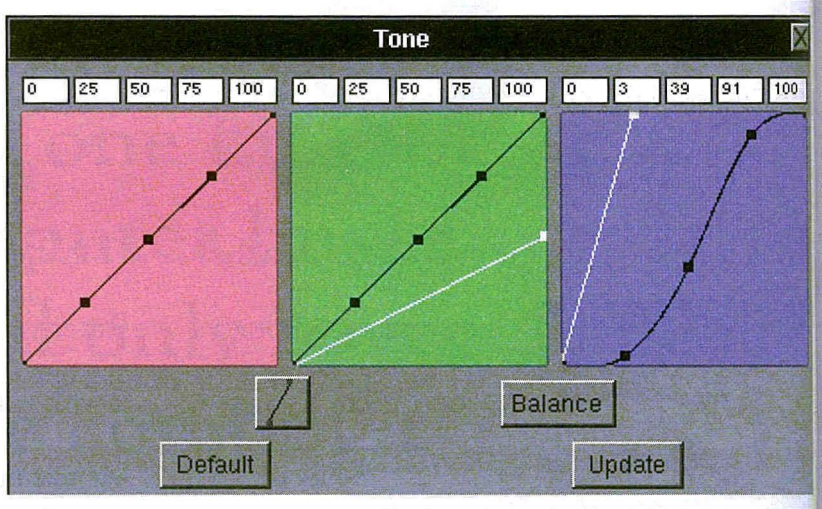
Universal Scanner Software

Most scanners on the market can, theoretically, work with the NeXT. The interface (SCSI) is in place; what's missing is the software that controls the scanner. ScanTastic from Second Glance provides that link, supplying NeXT software that can drive a variety of scanners.

With its first release, ScanTastic is offering drivers for two scanners, the Epson ES-300C flatbed scanner and the Nikon LS3500 and LS3510 35mm slide scanner, with more – supporting scanner models from XRS, the Microtech 600Z, and others – promised in the near future. By employing software that drives multiple scanners, users in mixed-scanner environments have the benefit of a consistent interface. They also get access to more scanner options than they would by relying on individual manufacturers to supply NeXT drivers.

In addition to simply driving scanners, ScanTastic supplies the first image-manipulation features to appear on the NeXT platform. Such features as gamma correction, for example, haven't been available on the NeXT until now. (On the Mac, they're standard in color scanning image-manipulation packages.) ScanTastic's features are quick, the display is informative, and every step can be undone.

ScanTastic also supplies filters (to sharpen, brighten, rotate, and so on). It lets you choose and apply several filters at one time, a real time-saver. ScanTastic simulates the effects of the filters on-screen, without changing the data, resulting in a less-informative display and a less-pleasing "feel" than you may be used to in Adobe Photoshop on the Macintosh. But the payoff is the ability to undo the filters in any combination.



ScanTastic's gamma-correction feature provides both graphic and numeric controls to change RGB output.

User interface is the program's weakest point. The application opens up with three windows of selections, and every new function appears in yet another new window. There are so many windows that I thought I had opened more than one application the first time I used it. Another drawback is that the Preview window has no zoom, and is not resizable. There is also no way to select only a portion of an image for scanning. On the plus side, scanning is easy to do and to correct, and the interface involved very few modal dialog boxes. Documentation is on-line only.

Second Glance is already making plans for taking advantage of the PostScript Level 2 that will be in NeXTstep 3.0. ScanTastic should be able to take advantage of any CIE colorspace modules that are available and relevant to the image being scanned. This is still in early development, but should be a significant advantage over scanning with the same hardware on another platform.

Current pricing for ScanTastic is $595 for the Epson ES-300C and $995 for the Nikon LS3500 or LS3510. (The Epson engine is especially strategic because it is used in many color flatbed scanners targeted at the Macintosh market.) Second Glance says once an initial version is purchased, subsequent modules can be added "inexpensively," though no prices had been announced at press time. The scanner/software bundle is in line with market prices, but the software-only prices seem unnecessarily high.

by RICK REYNOLDS

ScanTastic

A well-implemented universal scanner controller that offers simple image-manipulation features and a consistent scanning interface across scanner models. A confusing user interface and a high price mar a good package.

$595 for Epson ES-300C driver;
$995 for Nikon LS3500 or LS3510 driver;
$1195 with Epson ES-300C

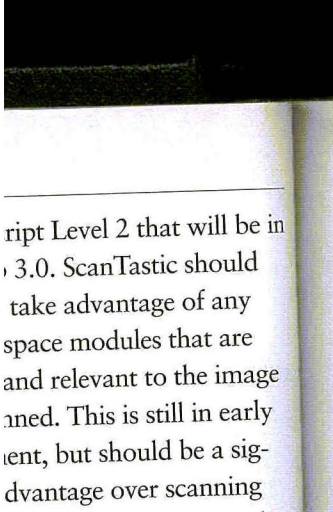
Second Glance, 25381-G Alicia Pkwy. #357, Laguna Hills, CA 92653. 714/855-2331, 714-586-0930 fax; e-mail: SecondGlance@applelink.apple.com

SIMSON00000914

SIMSON00000915

ript Level 2 that will be in
3.0. ScanTastic should
take advantage of any
space modules that are
and relevant to the image
ined. This is still in early
ent, but should be a sig-
dvantage over scanning
same hardware on another

ent pricing for ScanTastic
or the Epson ES-300C
5 for the Nikon LS3500
10. (The Epson engine is
y strategic because it is
nany color flatbed scanners
at the Macintosh market.)
Glance says once an initial
is purchased, subsequent
s can be added "inexpen-



phic and numeric controls to change

," though no prices had been
inced at press time. The scan-
ftware bundle is in line with
et prices, but the software-only
seem unnecessarily high.

RICK REYNOLDS

NeXTWORLD

FREE PRODUCT INFORMATION

1 Simply print your name, title, address and telephone number on the attached card. And answer the three questions.

2 Circle the numbers on the card that match the number at the bottom of the ads which interest you.

3 Mail this card today. POSTAGE IS ABSOLUTELY FREE!

Information from Advertisers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Product Showcase Information

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150

Please print clearly

Name

Title

Company

Address

City, State, Zip (required)

Country

Phone: (Area code/Number) FAX

A. Department you most often work in (please check one):
- ❑ 1) Accounting, finance or auditing
- ❑ 2) Administration or general management
- ❑ 3) Design or creative services
- ❑ 4) Education or training
- ❑ 5) Engineering
- ❑ 6) Manufacturing, production or operations
- ❑ 7) Marketing, promotion or communications
- ❑ 8) MIS/DP, tech. services or tech. documentation
- ❑ 9) Other

B. Computer you use at work or at home (please check all that apply):
- ❑ 10) IBM or compatible
- ❑ 11) Macintosh
- ❑ 12) NeXT
- ❑ 13) Unix workstation

C. Publication you read regularly (please check all that apply):
- ❑ 14) Business Week
- ❑ 15) Byte
- ❑ 16) Communications Week
- ❑ 17) Computer Reseller News
- ❑ 18) Computerworld
- ❑ 19) Forbes
- ❑ 20) Fortune
- ❑ 21) Infoworld
- ❑ 22) LAN Times
- ❑ 23) MacUser
- ❑ 24) Macweek
- ❑ 25) Macworld
- ❑ 26) PC Magazine
- ❑ 27) PCWorld
- ❑ 28) Personal Workstation
- ❑ 29) Publish
- ❑ 30) Sun Tech Journal
- ❑ 31) Unix Review
- ❑ 32) Unix World
- ❑ 33) Wall Street Journal

❑ Check here for a one-year subscription to NeXTWORLD. $23.95/year (4 quarterly issues plus 8 BONUS issues of NeXTWORLD EXTRA – THE NeXTWORLD newsletter.)

All foreign orders please add $15 for surface mail or $80 for airmail. Canadians please add $18 for postage and GST tax. All foreign orders must be pre-paid in U.S. funds only.

SPRING ISSUE EXPIRES MAY 26, 1992

Information from Advertisers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Product Showcase Information

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150

Please print clearly

Name

Title

Company

Address

City, State, Zip (required)

Country

Phone: (Area code/Number) FAX

A. Department you most often work in (please check one):
- ❑ 1) Accounting, finance or auditing
- ❑ 2) Administration or general management
- ❑ 3) Design or creative services
- ❑ 4) Education or training
- ❑ 5) Engineering
- ❑ 6) Manufacturing, production or operations
- ❑ 7) Marketing, promotion or communications
- ❑ 8) MIS/DP, tech. services or tech. documentation
- ❑ 9) Other

B. Computer you use at work or at home (please check all that apply):
- ❑ 10) IBM or compatible
- ❑ 11) Macintosh
- ❑ 12) NeXT
- ❑ 13) Unix workstation

C. Publication you read regularly (please check all that apply):
- ❑ 14) Business Week
- ❑ 15) Byte
- ❑ 16) Communications Week
- ❑ 17) Computer Reseller News
- ❑ 18) Computerworld
- ❑ 19) Forbes
- ❑ 20) Fortune
- ❑ 21) Infoworld
- ❑ 22) LAN Times
- ❑ 23) MacUser
- ❑ 24) Macweek
- ❑ 25) Macworld
- ❑ 26) PC Magazine
- ❑ 27) PCWorld
- ❑ 28) Personal Workstation
- ❑ 29) Publish
- ❑ 30) Sun Tech Journal
- ❑ 31) Unix Review
- ❑ 32) Unix World
- ❑ 33) Wall Street Journal

❑ Check here for a one-year subscription to NeXTWORLD. $23.95/year (4 quarterly issues plus 8 BONUS issues of NeXTWORLD EXTRA – TH NeXTWORLD newsletter.)

All foreign orders please add $15 for surface mail or $80 for airmail. Canadians please add $18 for postage and GST tax. All foreign orders m be pre-paid in U.S. funds only.

SPRING ISSUE EXPIRES MAY 26, 1992

FREE PRODUCT INFORMATION

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 859 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

NeXTWORLD, READER SERVICE DEPARTMENT
P.O. BOX 5068
PITTSFIELD MA 01203-9657

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 859 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

NeXTWORLD, READER SERVICE DEPARTMENT
P.O. BOX 5068
PITTSFIELD MA 01203-9657

NeXTWORLD

Photos W

The idea of digital
raphy has a lot o
Just point, shoot,
import the image
your computer. U
nately, early digital camera
suffered from poor image
Also, transferring images u
of cables, wires, or disks is
some at best.

Now, Dycam has intro
new form of digital photog
that is elegant and easy to
available for a variety of co
systems, with a NeXT vers
marketed by Prism Techno
works well within a define
of uses.

The Dycam system co
a camera and a charger/doc
station. The docking station
plugged into the computer
a serial cable. A user roves
with the camera, taking pic
brings it back to the dockin
tion, plugs it in, and the sof
the computer pulls the imag
off. There is no film, no wi
no moving parts.

Review Upda

Over the past year, *NeXTWORLD*
reviewed several products while th
still in the beta or pre-release stage
opment. In these reviews we did n
the vendors down for bugs or poo
mance. They were, however, only
to achieve a maximum of four ou
cubes, pending a final review.

Below, we revisit those produ
were assigned beta ratings and upd
as promised. In addition, we will u
space to update the reviews of pro
have had incremental new releases.

Based on the update, a produ
may be increased, decreased, or co
in place.

Lotus Improv 1.0

Reviewed in beta: January/February 1
Shipped: February 1991

Improv shipped with few bugs, no
them major. The performance is go
in general the program performs as
Improv remains a revolutionary ad
in spreadsheets, adding a new para

SIMSON00000916

SIMSON00000917

Photos Without Scanning

The idea of digital photography has a lot of appeal. Just point, shoot, and import the image into your computer. Unfortunately, early digital cameras have suffered from poor image quality. Also, transferring images using lots of cables, wires, or disks is cumbersome at best.

Now, Dycam has introduced a new form of digital photography that is elegant and easy to use. It is available for a variety of computer systems, with a NeXT version marketed by Prism Technology. It works well within a defined range of uses.

The Dycam system consists of a camera and a charger/docking station. The docking station remains plugged into the computer through a serial cable. A user roves about with the camera, taking pictures, brings it back to the docking station, plugs it in, and the software in the computer pulls the images right off. There is no film, no wires, and no moving parts.

This camera is a point-and-shoot model. It has no focusing or f-stop settings. A built-in flash goes off when needed. The default setting is for hand-held use, but the software can reconfigure the camera for longer exposures when using a tripod. The focus works from three feet to infinity. An optional lens set adds telephoto and wide-angle capabilities, and the package includes a filter for outdoor use.

The camera produces images of 370 by 240 pixels, giving a pleasing 4:3 aspect ratio, with 256 shades of gray. Up to 32 images can be stored in the camera at any one time. While the image quality is as good or better than for scanned images, they are not film quality. Printing the images on a NeXT Laser Printer degrades the quality a little further, resulting in quality equivalent to a photocopy of a newspaper picture.

When the camera is placed in the docking unit, thumbnails, or small recognizable icons of the picture you want to see, appear in a window. This process is fast and convenient. Only when you double click an image is it loaded at full resolution from the camera into the NeXT. Because the images are 100KB compressed and transmitted at 34KB per second, the images take a few moments to load. The contrast and brightness of each picture is adjustable. Individual pictures can be saved in TIFF or EPS format, or entire rolls can be saved.

The NeXT software, developed by Prism, was still in the beta phase as we tested the product. The software is good, but lacks many features that one would expect, like the ability to custom-construct rolls and selectively delete images.

The Dycam has many pluses. It is ergonomically outstanding, aesthetically a true companion for the NeXT machine. It is fast and easy to use. If the image quality is sufficient for the application, it is the perfect way to get images into your computer without hassling with cables, cartridges, or scanning.

There are drawbacks as well. The cost, $995, is steep for fun photography. The power requirements of the camera are limiting: It can store images for only 24 hours away from the charger/docking station before the camera goes dead and loses them.

In short, the Dycam system is a great way to get images into a computer. If your application can make do with newspaper-quality photographs – applications like video databases or computer-generated newsletters – this is an excellent tool.

Dycam



A simple yet elegant digital camera that delivers images directly into your computer. A user can roam about taking pictures, then reinsert the camera into a charger/docking station and software will provide thumbnails of the pictures. An excellent tool, the high price and newspaper-quality images may make it inappropriate for some users.

$995

Prism Technologies, RR4 Site 28Box 8, Sudbury, Ontario, P3E 4M9 Canada. 705/523-5528, 705/523-2372.

by DAN LAVIN

Review Updates

Over the past year, *NeXTWORLD* has reviewed several products while they were still in the beta or pre-release stage of development. In these reviews we did not mark the vendors down for bugs or poor performance. They were, however, only eligible to achieve a maximum of four out of five cubes, pending a final review.

Below, we revisit those products that were assigned beta ratings and update them as promised. In addition, we will use this space to update the reviews of products that have had incremental new releases.

Based on the update, a product's rating may be increased, decreased, or confirmed in place.

Lotus Improv 1.0



Reviewed in beta: January/February 1991
Shipped: February 1991

Improv shipped with few bugs, none of them major. The performance is good, and in general the program performs as expected. Improv remains a revolutionary advance in spreadsheets, adding a new paradigm to computer software. The faults cited in the review remain extant. There are no undo or no macro functions. For these reasons, we confirm Improv's rating at four cubes. A five would require fixing those drawbacks.

PowerStep (no rating)

Reviewed in beta: January/February 1991
Shipped: Still waiting

PowerStep never made it to market. With the acquisition of Ashton-Tate by Borland, it remains unclear when or if PowerStep will ever be released. Therefore, we remove PowerStep's beta rating of two cubes and will reevaluate the product if it comes to market.

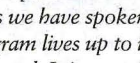
Create 1.0



Reviewed in beta: January/February 1991
Shipped: October 1991

Create was reviewed very early in its development cycle. Surprisingly enough, the final product appeared almost a year later, very much like the early version, but with some extras like a good help system. Create allows the average user to achieve complicated effects in short order. While achieving an effect is easy, creating the specific effect you had in mind requires travel up a learning curve; the user interface metaphors employed could be confusing to a professional illustrator. Also, we hit a few small bugs. Still, Create is a tour de force of PostScript manipulation and we confirm its rating of four cubes.

Diagram 1.1



Reviewed in beta: January/February 1991
Shipped: 1.0, January 1991; 1.1, November 1991

Diagram shipped with very few surprises and very few bugs. Most bugs that did appear were fixed in Version 1.1, which also added more sample documents and made Diagram files compatible with Digital Librarian. Users we have spoken with have found that Diagram lives up to its billing as a digital whiteboard. It is one of our favorite tools around NeXTWORLD. *The final product, as delivered in Version 1.1, is confirmed at a rating of four cubes.*

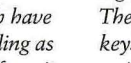
3270Vision 2.130



Reviewed in beta: January/February 1991
Shipped: 1.0, September 1990; 2.1, May 1991

3270Vision has not only shipped, it has been upgraded several times since we looked at it last. It now supports 3290 terminals as well as 3270s. Our reviewer was concerned about the lack of an Operator Interface Line and a file transfer utility. Both of these features have been added. Conextions has also added interfaces to various other NeXT programs. All in all, 3270Vision is an excellent terminal emulator and is confirmed with a rating of four cubes.

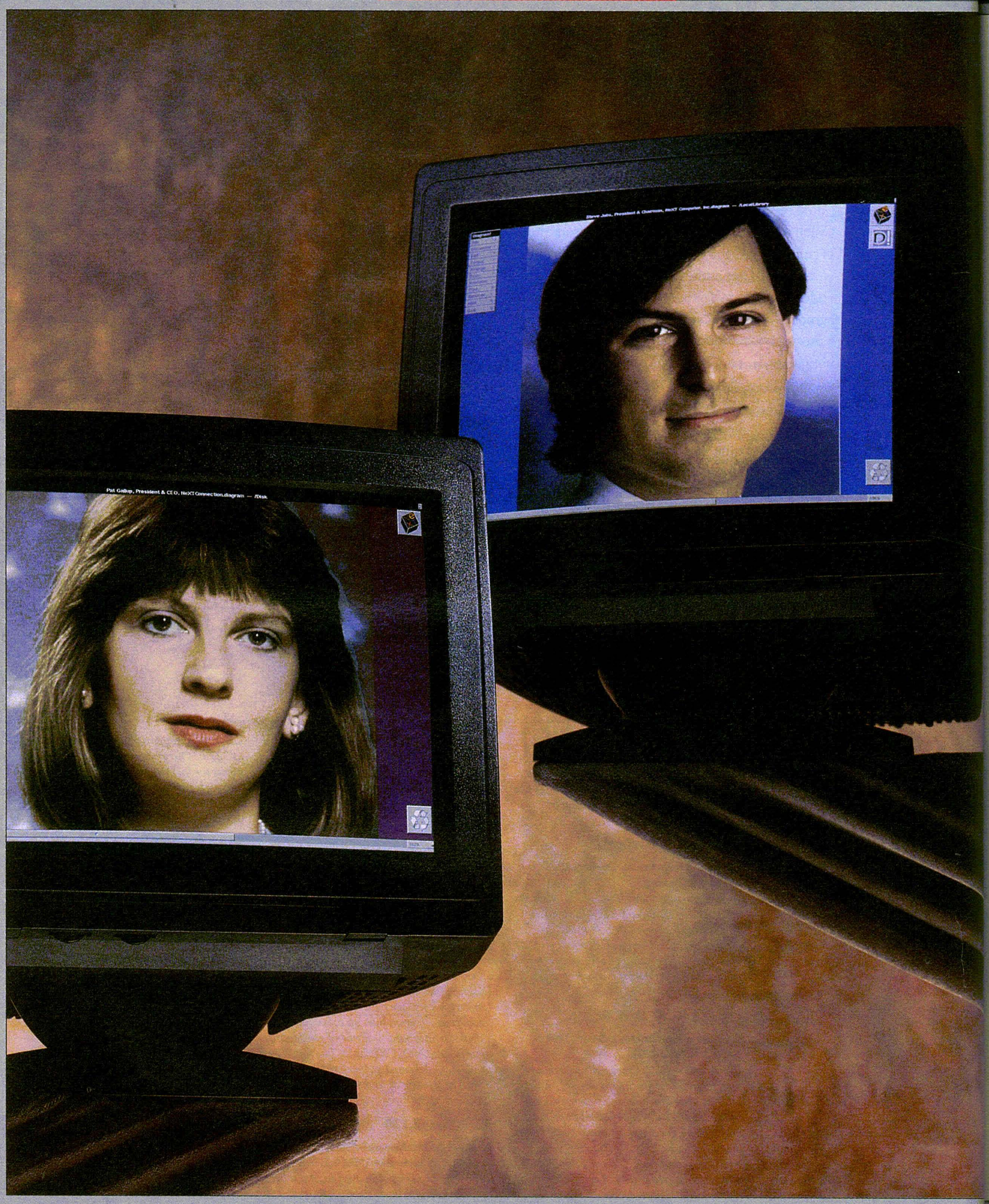
SoftPC 2.5



Reviewed in beta: March/April 1991
Shipped: 1.0, March 1988; 2.5 October 1991

SoftPC shipped, accomplishing all of its promises. Bugs are few, and it remains an ingenious PC emulator for use on the NeXT. The problems with ergonomics and function keys mentioned in our review remain. More seriously, the emulation of some programs is not blazing. In the final version, any serious long-term work in a graphical environment would be difficult. We still love SoftPC for many uses, but these drawbacks hold it to a still-admirable four cubes.

NeXTConnection™



"T

What I really like ab
approach mail or
making computer
tools they need to work m
by making it easy to buy
by providing the technical
out of those products. De

CRITIC

What we like abou
is that you reall
When we starte
have much confidence i
to prove that we could
support better than any
understanding that our

SIMSON00009119

NeXTConnection™

"IT'S A GREAT PARTNERSHIP FOR ALL CONCERNED."

Steve Jobs, President & Chairman, NeXT Computer Inc.

What I really like about NeXTConnection is that you approach mail order the same way we approach making computers: you want to give people the tools they need to work more effectively. And you succeed—by making it easy to buy NeXT software and peripherals, and by providing the technical help customers need to get the most out of those products. Developers love NeXTConnection too, because you make all their programs instantly available to the entire NeXT community. We actually approached you about creating NeXTConnection because our customers kept raving about this terrific mail-order company in New Hampshire that sold products for the PC and Mac. And you're more than living up to your advanced billing—by being helpful, fast, and efficient. It's a great partnership for all concerned.

"WE PROVIDE THAT CRITICAL LINK BETWEEN CUSTOMERS, DEVELOPERS, AND NEXT."

Pat Gallup, President & CEO, NeXTConnection

What we like about selling products for NeXT computers is that you really understand the value of mail order. When we started PC Connection in 1982, people didn't have much confidence in computer mail order. So we set out to prove that we could deliver prices, service, *and* technical support better than anyone else in the computer industry. Your understanding that our organization is an integral part of the NeXT market means we can do our job even better. Besides making products widely available—backed by our services like toll-free tech support and $3 overnight shipping—we're also able to provide that critical information and feedback link between customers, developers, and NeXT itself. Best of all, we can do so while remaining independent and objective. And that will continue to help all of us get the most out of our NeXT computers.

NeXTConnection™



LOTUS REINVENTS THE SPREADSHEET.

LOTUS IMPROV

Look at your data in a whole new light. What happens when you give the creators of the world's best-selling spreadsheet an 040 processor, 8 MB of RAM and let them improvise to their heart's content? You get **Lotus Improv**, a revolutionary spreadsheet for analyzing, viewing, and presenting your data in ways never before possible.

The unique dynamic views feature of Improv lets you see the same data in multiple ways to explore data relationships and prepare targeted reports. Just use the mouse to rearrange your spreadsheet and get a whole new view instantly, without any re-keying. You can actually work with 12 different dimensions of data at once, displayed in 2D or 3D format.

Improv lets you use plain English to define cells and create formulas (e.g., "Dollars = Tons x 12.5"). So your spreadsheets document themselves and are easy to modify or re-use. For complex formulas, you can call on a host of built-in *Lotus 1-2-3*-style functions. All of which makes it easy to build spreadsheets from scratch. You can also use the extensive collection of prepackaged templates and/or import existing *1-2-3* files directly.

Improv lets you combine graphs, texts, images, and even sound with stunning clarity and resolution that takes full advantage of NeXT. But how good is it, really? *Byte* (10/90) wrote, "Improv knocked me out." *PC World* (11/90) called it "a stunningly simple approach to organizing complex data." *What Micro? Magazine* (UK, 4/91) awarded it "Most Innovative Product 1990." And *InfoWorld* (10/91) wrote, "Improv is an exciting alternative to traditional spreadsheet programs. ...it's one of the most innovative programs we've seen in some time."

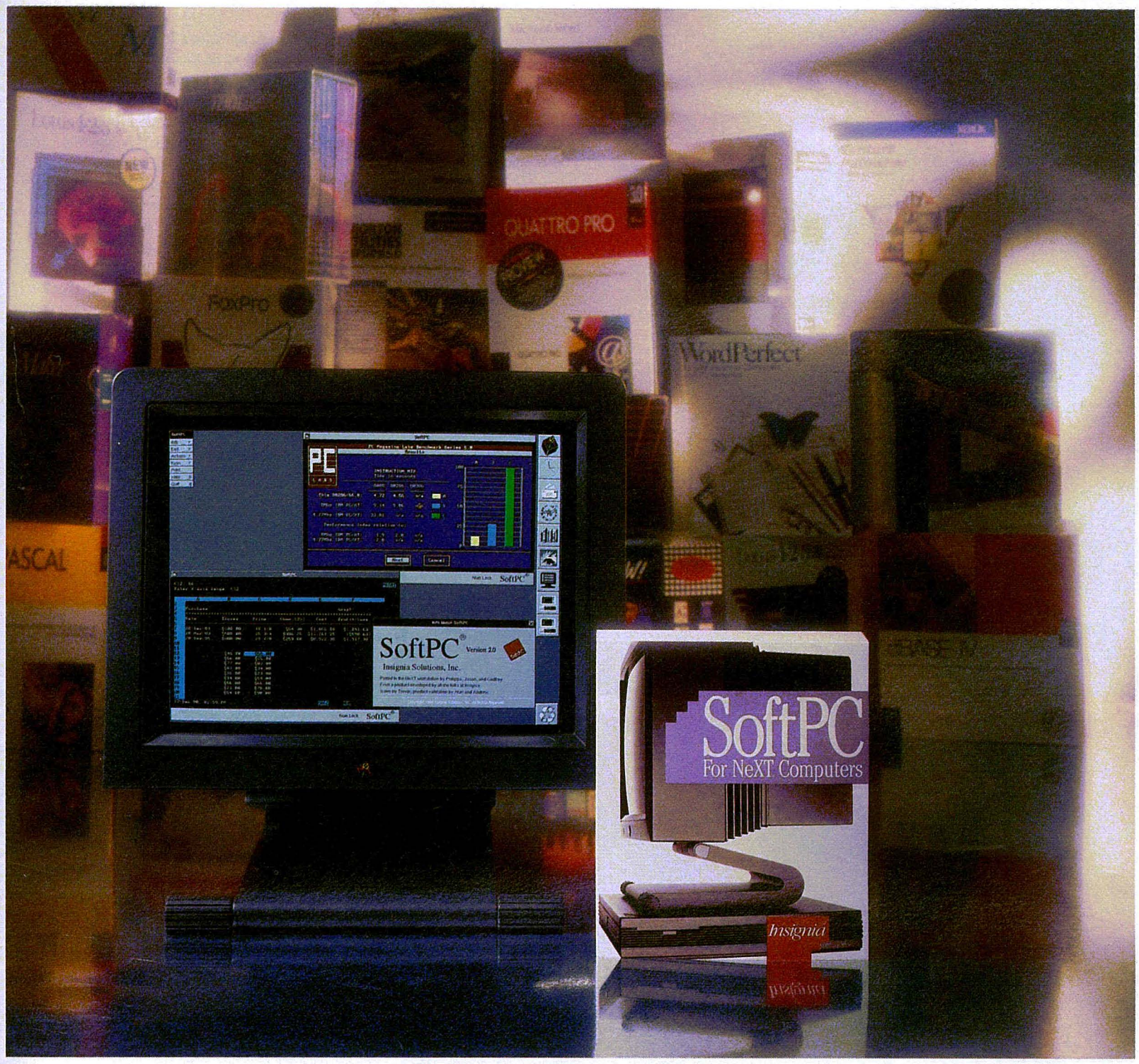
Lotus Development
9794 Improv 1.0 **$549.**

Latest versions only.

SIMSON00000920

SIMSON00000921

NeXTConnection™



OPEN THE DOOR TO DOS.

SoftPC

It's a PC-on-a-disk! Now you can run most MS-DOS applications on your NeXT system with **SoftPC**, the software-based PC emulator. If you depend on a specialized PC program or PC datafile—or have PC-based co-workers—SoftPC can make platform hopping simple and fast. It'll also help you protect your investment in DOS software and training. As *NeXTWORLD* (4/91) said, "This undertaking is so important and so difficult, and SoftPC succeeds so well at it, that SoftPC ranks as one of the most important programs for the NeXT."

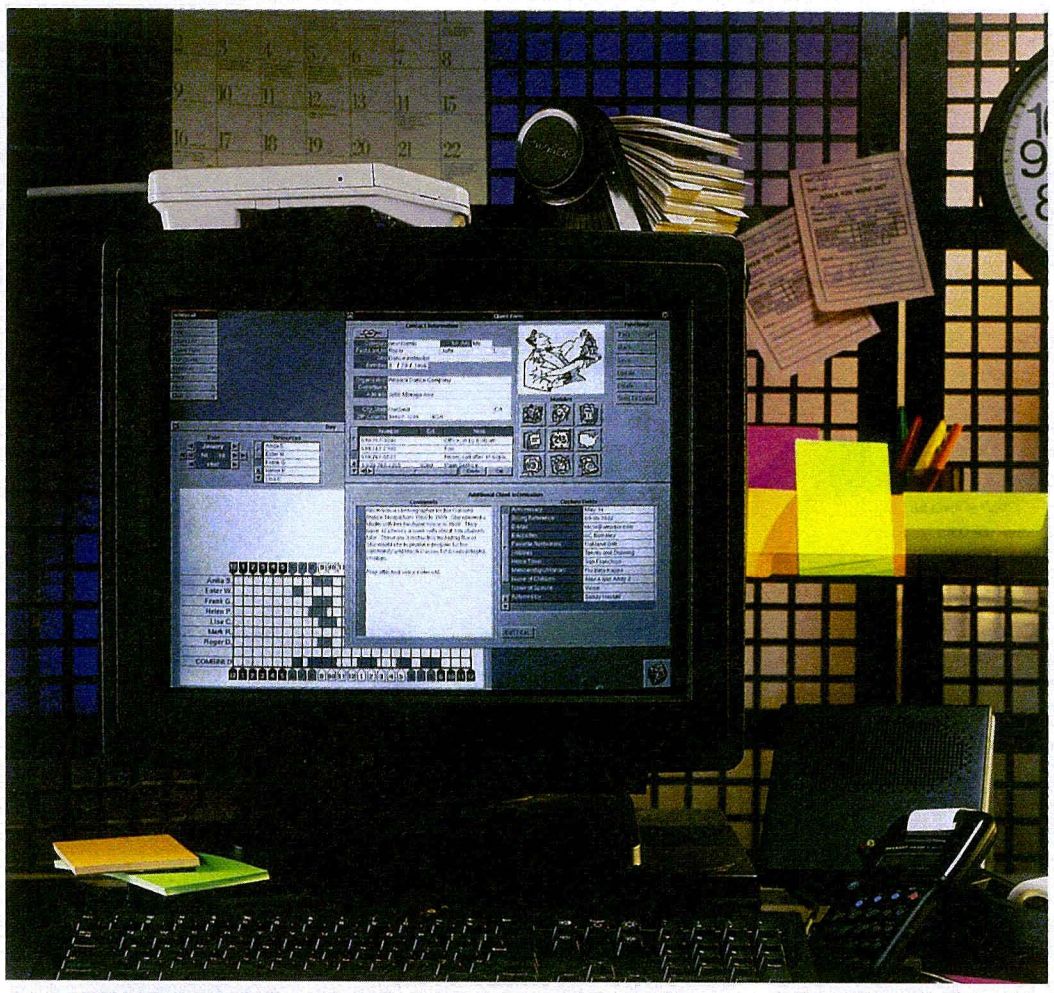
SoftPC duplicates an IBM PC/AT with 80286 and 80287 processors, offering C:and D: drives, MS-DOS 3.3 (you can install 4.0), and support for EGA and CGA video in monochrome and color. There are two printer ports and two communication ports that can be directed to NeXT serial ports or to any UNIX device, process, or file. SoftPC will even transform your NeXT mouse into a Microsoft mouse on the screen.

SoftPC's special features give DOS applications a boost in performance and versatility by allowing you to run multiple DOS windows. NeXT and DOS software can run side by side and share files as easily as copying them. NeXT modems, printers, floppy drives, and other serial peripherals are available to your PC program. And for mega-applications, SoftPC opens up an astounding 32 MB of RAM.

While SoftPC will work on any system running NeXTstep 2.0, a 68040 processor is recommended. Get the power of the NeXT with the rich application library of DOS—isn't that what you've been waiting for? Well, you can have it all with SoftPC.

Insignia Solutions
1456 SoftPC 2.05 **$329.**

Call 1-800/800-NeXT to order.



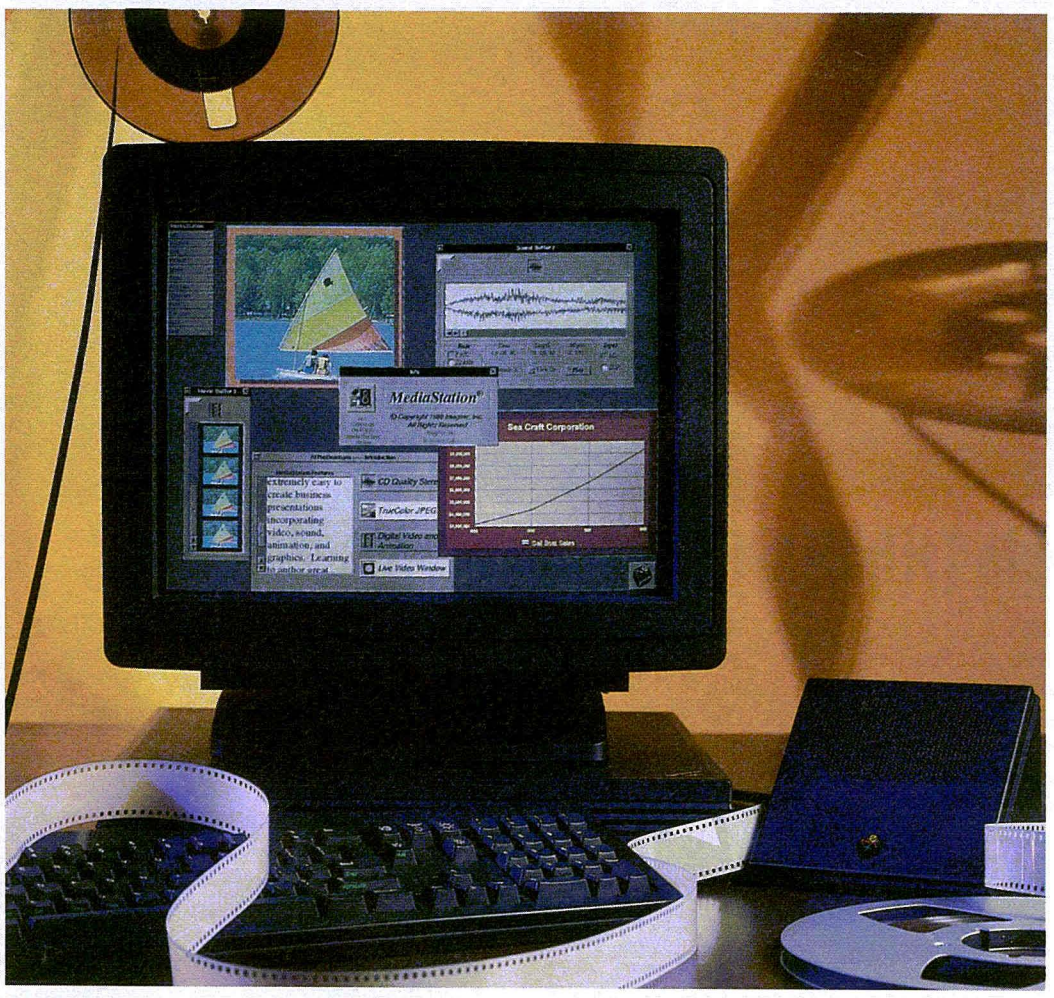
WHO'S CALLING?

Clear the desk! Just add **Who's Calling?** to your NeXT computer and forget about traditional Rolodexes, phone logs, message pads, and calendars. You'll have a fully automated client management and scheduling system with modules for tracking client information and conversation histories and sending live network messages. Since it's on your NeXT, you'll be able to attach sound, image, and DEG text files to client records. And for your own special requirements, you can add an unlimited number of custom data fields.

Program features will remind you when to call a client (Calendar), make the call for you (Speed Dialer), provide you with complete data on the person you're talking to (Conversation Manager), and plan the next callback (Tickler). On a NeXT network, you can send live messages to other users, schedule group meetings, and have multiple users query a central database.

If your calls are billable, Who's Calling? will automatically calculate client billing from the length of the call. In addition to billing logs, it will also generate mailing labels, client lists, and conversation logs. Other built-in modules include an Advanced Calculator, Talking Alarm Clock, and Area Code and State Finders. You can also display or print upcoming events in daily, weekly, monthly, or six-monthly views. It's everything you need to always know Who's Calling.

Adamation ... 30 day MBG
3357 Who's Calling? 2.0. **$395.**



MEDIASTATION 2.0

Imagine there are no limits. Imagine orchestrating a flow of sound and vision into exactly what you had in mind. That is the reality of **MediaStation**. Think about how you use a computer. Now add a picture, now sound. Whether you work with personnel files or interactive history teaching, the possibilities are very exciting.

Design your own format, load scanned images, TIFF or EPS files, digitized video and stereo sound. Then edit or add your own cell-by-cell animation. Store the finished entry just like a database record, then organize your entries into a complete desktop presentation.

Now with *Version 2.0*, NeXTdimension users can use direct video output and record their presentations on videotape. Plus the new *video* datatype allows you to include live video in your presentations. There's also color scanning, more versatile database searches, video disk player control, compression preview, and faster presentation load and response—MediaStation is getting better all the time.

MediaStation is fully networked and supports DSP audio devices and the export of multimedia to other applications. Recommended storage devices include read/write optical disks and network file servers. Go ahead, see your dreams come to life on screen.

Imagine, Inc.
1396 MediaStation 2.0 **$495.**
1397 MediaStation *(5 pack)* **2995.**
1398 MediaStation *(20 pack)* **8995.**
1400 MediaStation Educational Package 2.0. **295.**



BERNOULLI TRANS

Fast enough for the desktop.
That's the beauty of the **Bernou**
Drive. It weighs just 8.5 pounds
of desk space, but is fast enough
time) to use as your daily disk d
storage capacity—90 MB per *re*

Bernoullis feature an innovativ
crash virtually impossible becau
suspended below the fixed read
don't make any contact. And **Be**
Removal Disks feature extrem
polycarbonate cases to withstan

No hidden charges.

SIMSON00000922

SIMSON00000923

NeXTConnection™

LING?

alling? to your NeXT
al Rolodexes, phone logs,
l have a fully automated
system with modules for
ersation histories and
ce it's on your NeXT, you'll
DEG text files to client
equirements, you can add
fields.
when to call a client
eed Dialer), provide you
u're talking to (Conversa-
lback (Tickler). On a NeXT
s to other users, schedule
sers query a central

lling? will automatically
h of the call. In addition to
ing labels, client lists, and
dules include an Advanced
Area Code and State
t upcoming events in daily,
s. It's everything you need

..... **$395.**

N 2.0

gine orchestrating a flow of
ou had in mind. That is the
t how you use a computer.
ther you work with person-
g, the possibilities are very

ned images, TIFF or EPS
d. Then edit or add your
finished entry just like a
entries into a complete

sion users can use direct
tions on video-
ows you to include live
also color scanning, more
sk player control, compres-
load and response—
ime.
d supports DSP audio
to other applications.
de read/write optical disks
ee your dreams come to

..... **$495.**
..... **2995.**
..... **8995.**
ge 2.0..... **295.**



THE '90s ARE REALLY GOING PLACES!

BERNOULLI TRANSPORTABLE DRIVE

Fast enough for the desktop. Light enough to travel. That's the beauty of the **Bernoulli 90 MB Transportable Drive**. It weighs just 8.5 pounds, takes up only 11″ x 11″ of desk space, but is fast enough (19 ms effective access time) to use as your daily disk drive. And it offers unlimited storage capacity—90 MB per *removable cartridge*.

Bernoullis feature an innovative design that makes a crash virtually impossible because the flexible medium is suspended below the fixed read/write head so the two don't make any contact. And **Bernoulli Gold Standard Removal Disks** feature extremely rugged engineering and polycarbonate cases to withstand shocks up to 1000Gs, the same as an eight-foot drop. In fact, they're so tough they have a *5-year* limited warranty. Buy your cartridges in the **90 MB Tri-Pack** from us and enjoy unlimited storage for well under $2 per MB.

All it takes to plug your NeXT into unlimited Bernoulli storage is a SCSI cable. And interface kits are available for Macs and PCs, so you can connect to virtually any other host machine. Plus, like the NeXT computers themselves, the Bernoulli 90 MB Transportable switches automatically from 110 to 220 power, so you truly can use it anywhere.

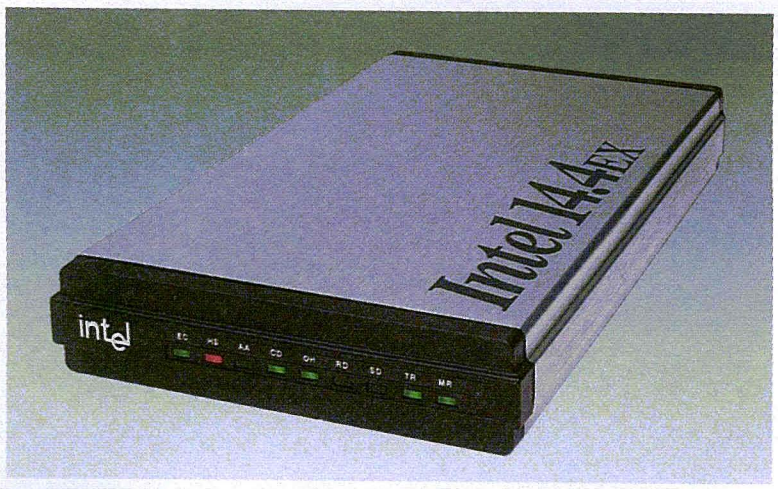
Need some references? The Bernoulli Transportable earned a *MacWorld* 1990 World Class Award, *Byte* Readers' Choice, *InfoWorld* Product of the Year, 4½ Mice from *MacUser*, and a 1991 *Publish Magazine* Readers' Choice Award. So if you're looking for the speed of a hard disk, the portability of a floppy, and the unlimited storage of a tape drive, you're looking right at a Bernoulli.

IOMEGA ... 1 year warranty

2224 Bernoulli 90 MB Transportable Drive..... **$799.**
2530 Bernoulli 90 MB Cartridge **149.**
2467 Bernoulli 90 MB Tri-Pack **439.**
2481 Care Kit..... **49.**

Call 1-800/800-NeXT to order.

NeXTConnection™



Intel 14.4EX Modem

V got it all. V.32 and V.32bis compliance; V.42bis and MNP 5 data compression; V.42, MNP 1-4, and TCM error correction. What does it all mean? It means that with Intel's new **14.4EX Modem**, your NeXT computer can talk to just about any other modem in the world with optimal ease, speed, and accuracy. And that means that you'll save time, money and anguish.

Just tell this modem what you want and sit back. It will quickly connect with the other modem (average: under 6 seconds), and negotiate the fastest mutual speed and best error correction and compression modes. It can even re-establish and continue some calls lost due to carrier or power failure. Comes with a 5-year warranty and free technical support.

Intel ... 5 year warranty

3864 14.4EX Modem *(requires cable)* **$549.**



Micropolis

Number one with the speed of a bullet. Always at the top of everyone's list of *high-capacity* external drive makers, Micropolis now offers its **280 MB MicroDisk** subsystem for the NeXT. Able to swallow huge image files in a single gulp, this drive can move up to 4 MB of data across an interface in a second and effectively access a file in as little as 4.4 ms.

The speed is impressive, but reliability is the key to confidence. The MicroDisk's 150,000 hour mean-time-between-failures is just part of a package that includes a 5-year drive warranty, a hefty power supply, and a silent high-flow cooling fan. Also available in configurations up to 860 MB.

Micropolis ... 5 year warranty

8984 280 MB MicroDisk *(formatted capacity)* **$1589.**
4415 550 MB MicroDisk *(formatted capacity)* **1889.**
4412 860 MB MicroDisk *(formatted capacity)* **2599.**

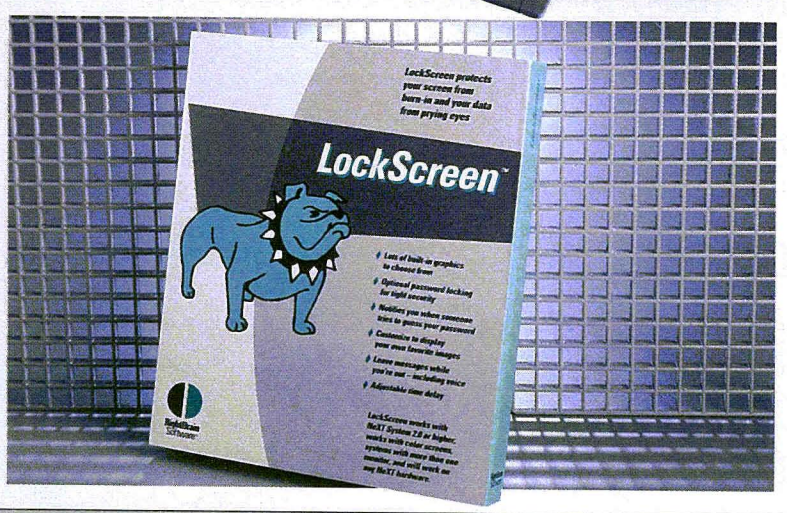


Sony Disks

Some little known facts about Sony disks. Did you know that Sony invented 3.5″ disk technology and media? Or that these **Sony 3.5″ Extra-High Density Diskettes** for your NeXT 2.88 MB drive are guaranteed accurate for up to *20 million passes* of your read/write head—now *that's* long life. Did you know that you can transfer data to them at 1 MB per second? Or that, while you should use them at temperatures from 50° to 140° F, you can expose them to temps as low as -40° F in transport? (Which is rather reassuring to those of us in the frozen tundra of Marlow, NH.) So now that you know the facts, keep a supply of these technological wonders on hand for taking your data from place to place or keeping it safe for years.

Sony ... 60 day MBG

3298 3.5″ High Density Disks *(10 Pack)* **$15.**
6375 3.5″ High Density Disks *(30 Pack)* **42.**
3614 3.5″ Extra-High Density Disks *(10 Pack)* **65.**
5030 3.5″ Extra-High Density Disks *(20 Pack)* **126.**



RightBrain Software

Creative utilities. LockScreen, the cult-classic NeXT screen saver, protects your screen from burn-in with the now-famous random word display or your own graphic, and lets you password-protect your screen. **LaunchPad** creates a scrolling list of hundreds of active icons, including documents, folders, and applications, that you can access just like Dock icons.

Design tools. Ideal for anyone who writes, designs, or publishes on a NeXT computer, **Portfolio** lets you store and select your TIFF and EPS files by thumbnail sketch rather than file name. Drag and drop the images into almost any application. RightBrain **Rulers**, a pair of horizontal and vertical guides, float above every application and make aligning objects, confirming image sizes, and centering graphics faster and easier.

RightBrain Software ... 30 day MBG

4148 LockScreen 3.2 **$79.**
4493 LaunchPad **79.**
4498 Portfolio **79.**
4494 Rulers **79.**

Overnight shipping $3.

SIMSON00000924

SIMSON00000925

mpression; V.42, MNP 1-4,
tel's new **14.4EX Modem**,
/orld with optimal ease,
nd anguish.
inect with the other modem
and best error correction
calls lost due to carrier or
ort.

..... **$549.**

eryone's list of *high-capacity*
subsystem for the NeXT.
e up to 4 MB of data across
ms.
MicroDisk's 150,000 hour
ear drive warranty, a hefty
nfigurations up to 860 MB.

..... **$1589.**
..... **1889.**
..... **2599.**

ony invented 3.5″ disk
ty Diskettes for your
sses of your read/write
them at 1 MB per second?
° F, you can expose them
o those of us in the frozen
ly of these technological
it safe for years.

..... **$15.**
..... **42.**
..... **65.**
..... **126.**

er, protects your screen
graphic, and lets you
f hundreds of active icons,
just like Dock icons.
s on a NeXT computer,
bnail sketch rather than
ghtBrain **Rulers**, a pair
nake aligning objects,

..... **$79.**
..... **79.**
..... **79.**
..... **79.**

NeXTConnection™



GET ALL YOUR GRAPHICS INTO PERFECT SHAPE.

LIGHTHOUSE DESIGN

Diagram! packs graphics power and production. Do you use graphics in your business? To get your message across fast and with high impact? **Diagram!** is a new kind of presentation graphics package that lets you combine drawings, data, sound, and even files from other applications quickly and effectively. Just double-clicking in your Diagram! drawing will open *Improv* spreadsheets, reveal *WordPerfect* or *FrameMaker* documents, or play back voice recordings. Setting links is as easy as dragging in a file and dropping it.

Diagram! is a full-featured graphics application with all the extras to make drawing, revising, and presenting information a snap. With customizable symbol palettes, you're freed from switching back and forth between conventional tools. Instead, you point to shapes and drag them into your document. If you don't see what you need, modify your palette and you've instantly customized Diagram!. In addition, once you've drawn a line between objects, Diagram! takes over: "rubberbanding" lines to automatically maintain organizational charts, process flows, or decision trees—any structured drawing. Overall, it's one of the biggest innovations in drawing technology since the Macintosh.

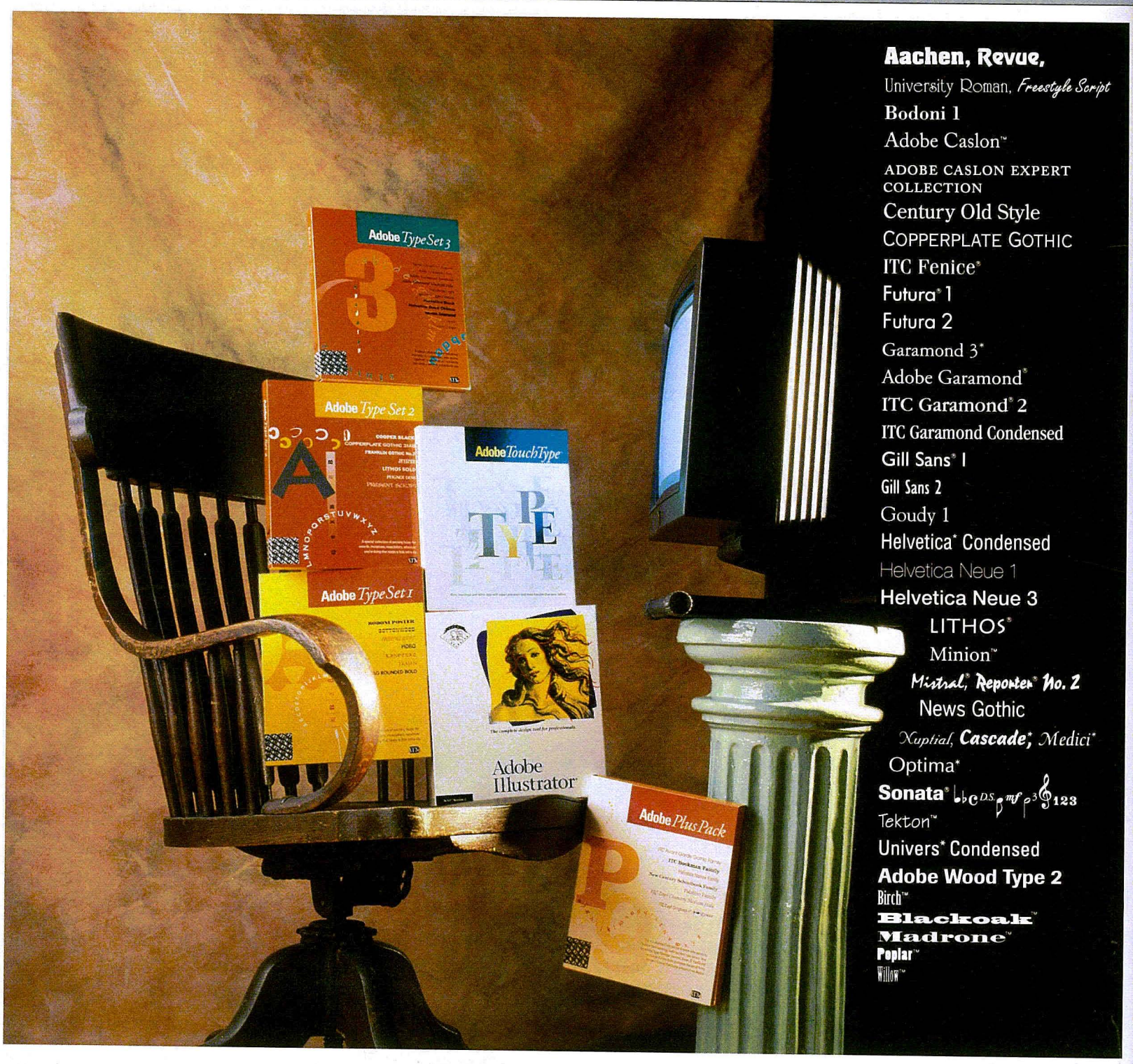
This is a graphics program designed for people who use them every day. And you don't have to be in business to enjoy the power of Diagram!—students and universities have proven to be big fans also. Ask about the special educational discounts available.

Want to get your hands on a lot of great NeXT shareware? The **Big Green Disk** gives you more than 400 megabytes of software, utilities, games, and other useful files on a single optical disk, including bundled GNU programs, MIT's X windowing system, and hundreds of UNIX programs. And for each Big Green Disk sold, Lighthouse Design will contribute $5 to environmental charities.

Lighthouse Design, Ltd. ... 60 day MBG
8621 Diagram! 1.1..... **$339.**
8663 Big Green Disk *(optical disk only)*..... **299.**

Call 1-800/800-NeXT to order.

NeXTConnection™



Aachen, Revue,
University Roman, *Freestyle Script*
Bodoni 1
Adobe Caslon™
ADOBE CASLON EXPERT COLLECTION
Century Old Style
COPPERPLATE GOTHIC
ITC Fenice®
Futura® 1
Futura 2
Garamond 3®
Adobe Garamond®
ITC Garamond® 2
ITC Garamond Condensed
Gill Sans® 1
Gill Sans 2
Goudy 1
Helvetica® Condensed
Helvetica Neue 1
Helvetica Neue 3
LITHOS®
Minion™
Mistral,® Reporter® No. 2
News Gothic
Nuptial, Cascade®, Medici®
Optima®
Sonata®
Tekton™
Univers® Condensed
Adobe Wood Type 2
Birch™
Blackoak™
Madrone™
Poplar™
Willow™

SEE HOW WELL ADOBE STACKS UP.

ADOBE ILLUSTRATOR

A must for anyone designing a page on a NeXT. With **Adobe Illustrator**, you can start from scratch, create grids for precision drawing, "Auto Trace" existing artwork (including color shades and hues), and/or import EPS and TIFF images. Enhance your visuals with airbrush, contour, highlight, and fill effects using as many colors as you like.

Enter and edit text directly, incorporating various typographic sizes, styles, and colors; and take advantage of sophisticated editing features like text wrap, kerning, vertical shifting, and custom letterforms. Illustrator uses NeXT fonts and color panels, so specifying type and color is easy (PANTONE support, too!). You can edit pages in "preview" or "preview selection" mode—you'll see changes instantly. And NeXT services like Mail or Librarian simplify file transfers and text searches. Overall, it's the ideal tool for business graphics, knock-out ads or flyers, and/or complex technical illustrations.

Also from Adobe, the new **Adobe TouchType** gives you expert typography in an easy-to-use interface. It's the perfect complement to Adobe Illustrator and all other applications that use or need type. Features include powerful kerning, a font selector that allows you to choose a typeface by viewing its design (rather than a list of names), and the ability to position letters anywhere on the page. And to spruce up your type collection, try the **Adobe Plus Pack** (22 popular Type 1 PostScript Fonts) and/or **Adobe Type Set Packages** for big savings over buying individual fonts.

Adobe Systems
1827 Adobe Illustrator 3.0 **$459.**
9741 Adobe TouchType 1.0 **175.**
9765 Adobe Plus Pack 1.0 **129.**
1832 Adobe TypeSet 1 **65.** 1832 Adobe TypeSet 2 **65.**
1834 Adobe TypeSet 3 **129.**

Corporate, educational, and government accounts welcome.

Fast and flexible font contro
view the entire character set of a
they look in text format? You ca
illustration, and presentation so
combinations, kern pairs, and fo
Accessing a unique character is
TypeView installs directly into
complete tasks that would norm
manual—and will give you the k
of before.

RightBrain Software ... 30
4496 TypeView 1.0

Maps for desktop publishin
graphics at your fingertips! Wit
it easy to create attractive map
ize maps with *Adobe Illustrator*
Maps feature country/state bor
feature is a separate object, yo
graphics to create your own de
world continents, plus detailed
ries. Now available on CD-RO

MicroMaps ... 30 day MB
9276 MapArt 1.0
2337 MapArt 1.0 *(CD-ROM)*. .

Talking turkey in space. Ev
a good, aggressive space gam
grab your headphones and se
rons of nasties and photon-pu
verse of asteroids. If you're or
graphics and DSP generated
cate with other players, monito
experience the Space Turkey g
figure out on your own—som

Lighthouse Design, Ltd. .
3315 Void 2.0 *(3 user license)*

Three little jewels. Protect
system up, saving only the n
learned with its own NeXTste
Enjoy voice-control with **Pl**
between words and phrases
it to type your voice mail or r
Need easy data entry, flexi
immediate entry of data with
in a PostScript or TIFF file as
work and can be refined with

Teledia
2513 Backup Master 1.0 . . .
2514 PhrasePlayer 2.0
4726 FileMaster 1.0

SIMSON00000926

SIMSON0000927

Revue,
Roman, *Freestyle Script*
slon™
SLON EXPERT
N
Old Style
LATE GOTHIC
e*
3*
amond*
nond* 2
nd Condensed
Condensed
Neue 1
Neue 3
HOS*
ion™
Reporter No. 2*
s Gothic
Cascade, *Medici**
ondensed
Wood Type 2
oak™
one™

nts) and/or **Adobe Type**
ver buying individual fonts.

..... **$459.**
..... **175.**
..... **129.**
832 Adobe TypeSet 2 **65.**
..... **129.**

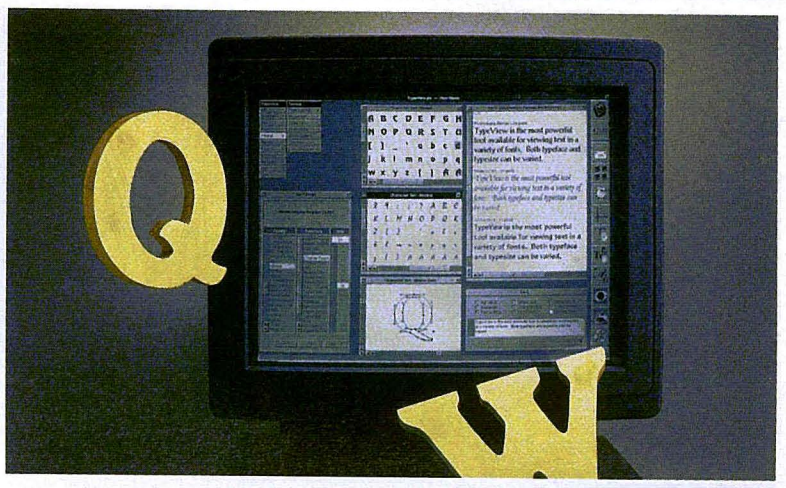
NeXTConnection™

TypeView

Fast and flexible font control. Have you ever tried to get access to a unique type character, view the entire character set of a particular font, or quickly analyze several fonts and see how they look in text format? You can with **TypeView**, the perfect companion for desktop publishing, illustration, and presentation software on NeXT computers. Access information such as key combinations, kern pairs, and font outlines. Easily master Kanji and foreign character sets. Accessing a unique character is as easy as cut and paste.

TypeView installs directly into the NeXT Services Menu and allows you, in 2-3 keystrokes, to complete tasks that would normally take 20-30. It's rich in features, including a robust on-line manual—and will give you the kind of control of your fonts that you could only have dreamed of before.

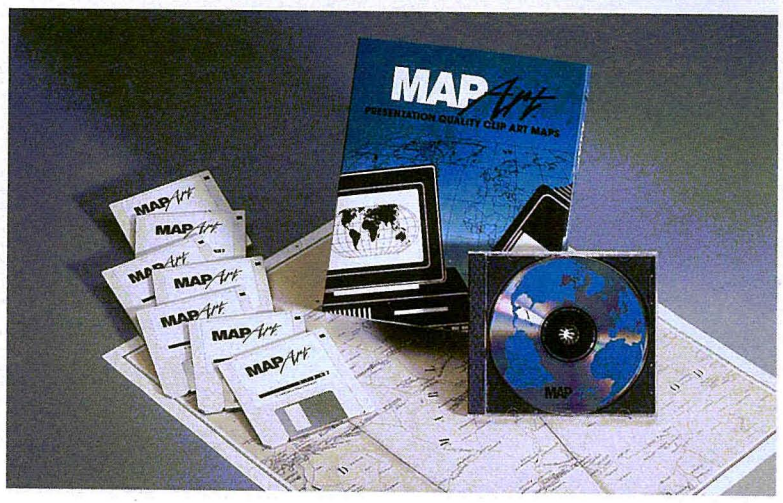
RightBrain Software ... 30 day MBG
4496 TypeView 1.0 **$99.**



MapArt

Maps for desktop publishing and graphic design. Imagine over 5 MB of high-quality map graphics at your fingertips! With **MapArt**, you get a comprehensive map collection that makes it easy to create attractive map graphics for brochures, newsletters, and presentations. Customize maps with *Adobe Illustrator* or import as background images in most NeXT applications. Maps feature country/state borders, latitude/longitude lines, and country/city names. Since each feature is a separate object, you can select areas, modify text, and add drop shadows and graphics to create your own design. MapArt includes four world maps, 12 regional maps of all world continents, plus detailed maps for 24 major countries that show state/province boundaries. Now available on CD-ROM, too!

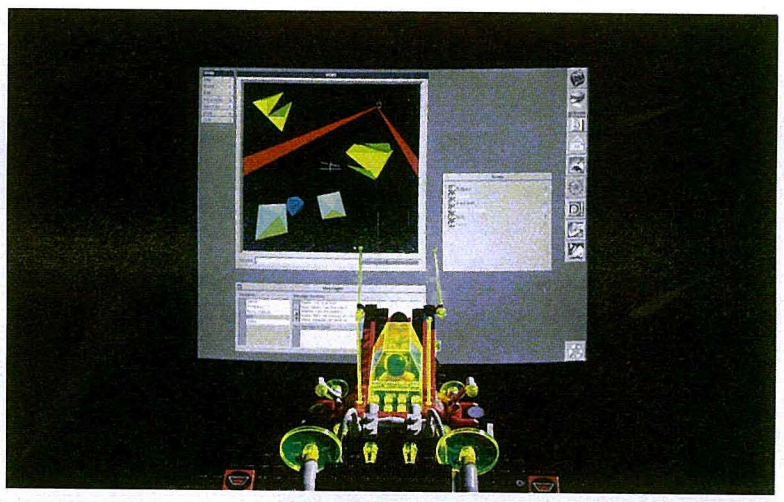
MicroMaps ... 30 day MBG
9276 MapArt 1.0 **$95.**
2337 MapArt 1.0 *(CD-ROM)*. **95.**



Void

Talking turkey in space. Ever think about what an incredible machine the NeXT would be for a good, aggressive space game? You're not alone. And now that the **Void** has arrived, you can grab your headphones and settle into the cockpit. If you're flying solo, you'll be battling squadrons of nasties and photon-pumping cyclops that interfere with your mission to clear the universe of asteroids. If you're on a network-Wow! Interoffice emotions finally have an outlet. 3D graphics and DSP generated stereo sound create a realistic environment where you communicate with other players, monitor your—and their—performance, blast your boss, and, yes, finally experience the Space Turkey gobbling sweet nothings in your ear. This ultimate thrill you'll have to figure out on your own—some things weren't meant to be advertised.

Lighthouse Design, Ltd. ... 60 day MBG
3315 Void 2.0 *(3 user license)* **$99.**



Teledia

Three little jewels. Protect your work with **Backup Master**. It automatically backs your system up, saving only the new and changed files, thus saving you time and media. Easily learned with its own NeXTstep interface.

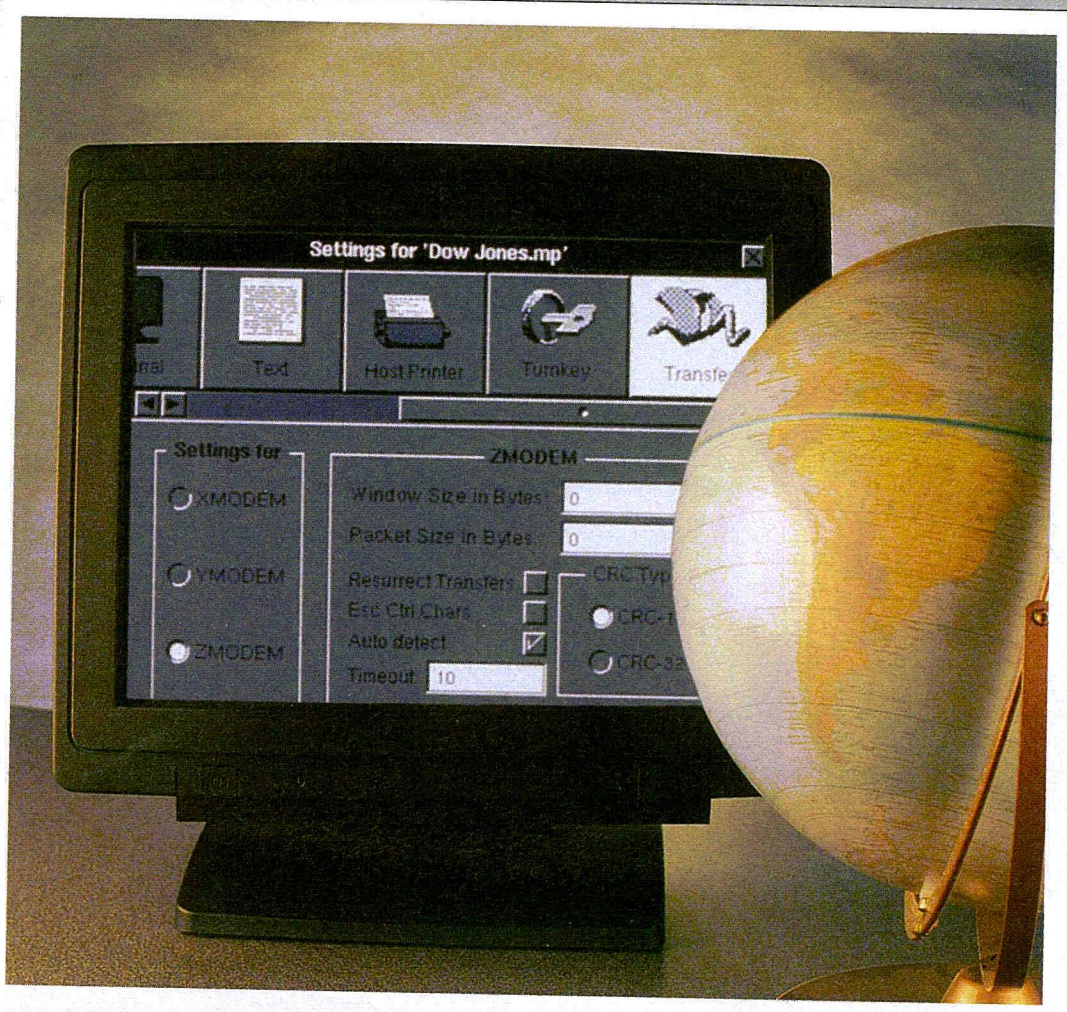
Enjoy voice-control with **PhrasePlayer**. This digital dictation machine will adapt pauses between words and phrases to your typing speed *and* can be controlled by your voice. Use it to type your voice mail or rehearse a speech.

Need easy data entry, flexible layout design *and* sophisticated queries? **FileMaster** allows immediate entry of data without having to build a layout. When you need a layout, you can drop in a PostScript or TIFF file as a background. Queries can use multiple files spread over a network and can be refined without restatement.

Teledia
2513 Backup Master 1.0 **$249.**
2514 PhrasePlayer 2.0 **129.**
4726 FileMaster 1.0 **299.**



Call 1-800/800-NeXT to order.



MicroPhone II

Great communications software has arrived. With **MicroPhone II**, you'll have easy, intuitive communications software that takes full advantage of NeXT capabilities (R.I.P. *tip*).

Watch in amazement or, better yet, do something else entirely, while MicroPhone II dials your mail service and automatically downloads your messages in the background.

Next time you log onto your favorite service, turn on the *Watch Me* feature and your keystrokes will be saved. Give the resulting script a button and you're never more than a click away. If you've written MicroPhone scripts in Windows or on the Mac, you'll discover you can use them on the NeXT with little or no modification.

Included are ready-to-run front ends for the most popular services, including CompuServe and Internet. You can also build your own NeXT front end with MicroPhone II's enhanced scripting power and NeXT's Interface Builder.

It's so easy to be on-line with MicroPhone II that you'll soon be doubling your pleasure and your productivity with the multi-session capability that allows you to log onto several information services simultaneously. Safely send or receive anything—text, pictures or sound—through a comprehensive set of file transfer protocols such as ASCII, XMODEM, YMODEM, and ZMODEM. Insanely great software for an insanely great computer.

Software Ventures ... 30 day MBG
4759 MicroPhone II 1.0 **$149.**



OnDuty

You deserve an executive secretary. And with **OnDuty**, the information manager for NeXT users, you can get the help you need. OnDuty helps you keep track of appointments, reminders, customers, friends, calls, ideas, sales, anniversaries, birthdays—you name it. Extensive preferences make OnDuty work the way you do, and custom folders let you organize names and notes in just the way you need.

The Calendar comes with a scheduler to assist you in finding time, an alarm to help you be on time, and reminders to keep you from losing time. The Name Manager will never forget one. The Notepad captures inspiration and encourages organization. The Contact Manager tracks calls with a built-in stopwatch and call-backs through the Calendar reminder and lets you maintain an accurate contact history.

Documents can be linked to notes, appointments, and reminders; reports can list all the managed data; and records can be private or public. Browse through your *Rollafile* of names, export names and addresses in mail-merge format, and, with an add-on module, download into the *Sharp Wizard* portable organizer. Does not make coffee.

Digital Instrumentation Tech. ... 1 year warranty
8657 OnDuty 1.0 **$209.**
8656 FloppyWorks 2.2D **69.**
8661 CubeFloppy 2.9 *(with FloppyWorks 2.2D)* **579.**

ISDN Syste

Connect to the new standard
It's called ISDN—Integrated Servi
digital telecommunications techr
high-speed data transmission. A
support it (like Marble's *Teleconr*
ware), you'll be able to handle al
cations from your NeXT comput
like multiple sessions over one l

The **Hayes ISDN System Ac**
serial port device that provides c
Northern Telecom's ISDN switch
switch software releases includi

It fully implements the Hayes
ISDN (which means you can acc
Hayes-compatible software) and
with supported software, opens
session capability).

Data transmission from 300 b
and voice capabilities include a s
along with battery feed and ring
analog devices (e.g., phone, fax
is truly the new age of telecomr
expect, Hayes is there on the fr

Hayes ... 2 year warranty
4998 ISDN System Adapter. . .

Why scrimp on storage? Get
Peripheral Land Drives. Their n
cartridges—the ideal choice for
around the world. And with its 2
use it as your daily drive. Need
including the **330 MB Hard Di**
of 2.25 to 2.75 MB/sec. We als
2.88 floppies.

Peripheral Land, Inc. ... 1
4847 Infinity 88 Turbo
8888 330 MB Hard Drive.....
8547 SuperFloppy 2.88
8893 Infinity 40 MB Cartridge D

Toshiba, the NeXT choice i
floppy disks to include with ea
patented the new technology t
2.88 MB disk technology. Ove
ferrite—and a new recording t
storage capacity of a conventi
rate. Toshiba 2.88 MB floppy c
expertise that's well beyond th
makers are just learning abou
one of their 2.88 MB ED flopp

Toshiba ... lifetime warra
9754 Toshiba 3.5″ ED Floppy
4858 Toshiba 3.5″ ED Floppy
9755 Toshiba 3.5″ ED Floppy

Toll-free technical support.

SIMSON00000928

SIMSON00000929

NeXTConnection™

E II

…as arrived. With …itive communications …eXT capabilities

…do something else …r mail service and auto- …n the background. …e service, turn on the …s will be saved. Give the …ever more than a click …ripts in Windows or on …them on the NeXT with

…s for the most popular …Internet. You can also …MicroPhone II's enhanced …Builder. …Phone II that you'll soon …roductivity with the multi- …og onto several informa- …end or receive …rough a comprehensive …ASCII, XMODEM, YMO- …oftware for an insanely

…3G …… **$149.**

…ary. And with **OnDuty**, …ers, you can get the help …k of appointments, re- …eas, sales, anniversaries, …eferences make OnDuty …ders let you organize …need. …ler to assist you in finding …, and reminders to keep …nager will never forget one. …encourages organization. …h a built-in stopwatch and …nder and lets you maintain

… appointments, and …aged data; and records …ugh your *Rollafile* of … in mail-merge format, …ad into the *Sharp Wizard* …offee.

1 year warranty
…… **$209.**
…… **69.**
…orks 2.2D)…… **579.**

ISDN System Adapter

Connect to the new standard of voice/data capabilities. It's called ISDN—Integrated Services Digital Network, a standard digital telecommunications technology for integrated voice and high-speed data transmission. And as software is developed to support it (like Marble's *Teleconnect* remote computing software), you'll be able to handle all your voice and data communications from your NeXT computer with exciting new capabilities like multiple sessions over one line and transfer of voice files.

The **Hayes ISDN System Adapter** is an external RS-232 serial port device that provides compatibility with AT&T and Northern Telecom's ISDN switches and will support future switch software releases including the National ISDN standards.

It fully implements the Hayes Standard AT Command Set for ISDN (which means you can access its power through familiar Hayes-compatible software) and Hayes AutoStream (which, with supported software, opens the door to multiple voice/data session capability).

Data transmission from 300 bps to 38,400 bps is supported, and voice capabilities include a standard analog phone interface along with battery feed and ring voltage for up to three typical analog devices (e.g., phone, fax, and answering machine). This is truly the new age of telecommunications and, as you would expect, Hayes is there on the front lines.

Hayes … 2 year warranty
4998 ISDN System Adapter…… **$1199.**



Peripheral Land Drives

Why scrimp on storage? Get the capacity you need now and for years to come with Peripheral Land Drives. Their new **Infinity 88 Turbo** lets you read and write *88 MB removable cartridges*—the ideal choice for archiving and for transporting huge files across the hall or around the world. And with its 20 ms access time (even faster with the built-in buffer) you can use it as your daily drive. Need mega-memory on-call? PLI has plenty of fixed hard drives, too, including the **330 MB Hard Disk**, featuring 14 ms average access time and data transfer rates of 2.25 to 2.75 MB/sec. We also carry PLI's **SuperFloppy 2.88** for reading 720K, 1.44 MB and 2.88 floppies.

Peripheral Land, Inc. … 1 year warranty
4847 Infinity 88 Turbo…… **$879.**
8888 330 MB Hard Drive…… **1749.**
8547 SuperFloppy 2.88…… **449.**
8893 Infinity 40 MB Cartridge Drive…… **669.**



Toshiba Disks

Toshiba, the NeXT choice in 2.88 MB ED Floppy Disks. NeXT chose Toshiba 2.88 MB floppy disks to include with each NeXT system for very good reasons. Toshiba invented and patented the new technology behind 2.88 MB disks and has 14 years of experience with 2.88 MB disk technology. Over that time, Toshiba developed a new recording medium—*barium ferrite*—and a new recording technology—*perpendicular recording*—to bring you twice the storage capacity of a conventional HD diskette with greater data security and twice the transfer rate. Toshiba 2.88 MB floppy disks are made in the USA using a new standard of manufacturing expertise that's well beyond those used today for conventional diskettes. So while other diskette makers are just learning about 2.88 ED disks, Toshiba delivers 14 years of experience in every one of their 2.88 MB ED floppies.

Toshiba … lifetime warranty
9754 Toshiba 3.5″ ED Floppy Disk *(single)*…… **$7.**
4858 Toshiba 3.5″ ED Floppy Disks *(5 Pack)*…… **30.**
9755 Toshiba 3.5″ ED Floppy Disks *(10 Pack)*…… **59.**



Call 1-800/800-NeXT to order.



Prometheus ProModems

The NeXT best thing for telecommunicating! You won't find a faster data/fax modem for your NeXT computer than the **ProModem Ultima**, a 14,400 bps data/9600 bps send/receive fax modem. Fully Hayes compatible, this true V.32bis-compliant modem guarantees raw speed connections of 14,400 bps and up to 57,600 bps throughput utilizing V.42bis/MNP 5 data compression and error correction!

Need to send and receive faxes? With the Ultima, you can do both directly from your computer. The Ultima supports the new Class II standard for fax modems, ensuring compatibility with the built-in fax software in the NeXT operating system. The Class II standard also means you'll be able to use the Ultima with other fax software programs in the future.

If faxing is your main priority and you don't require such a high-speed data modem, the **ProModem 24/96NSR *Plus*** offers a lower-cost option. You get all the same fax capabilities in a 2400 bps data modem version which, with V.42bis/MNP 5, can still give you up to 9600 bps throughput. And both are backed by a 2-year warranty from a company whose only business is modems!

Prometheus ... 2 year warranty
2197 ProModem Ultima *(includes 14.4 Modem)*..... **$769.**
2207 ProModem 24/96NSR *Plus (incl. 2400 Modem)*.. **339.**



Teleconnect

Home alone? Stay in touch with Marble **Teleconnect**. Whether you're a telecommuter or telestudent, or work in a satellite office, you can stay connected to *all* the resources of your central network, not just a single remote computer. With Teleconnect you'll be able to use your company mail system, specialized printers, and LAN-based applications—all the central office capabilities. If you're tied to the umbilical of a university Internet connection, break free! Now, Teleconnect will run the Internet Protocol (IP) on your NeXT computer over ordinary telephone lines and give you access to applications on your university/corporate net or global Internet.

Marble Teleconnect will communicate with any computer running the SLIP protocol. When connecting two NeXT computers, you have access to all of the inter-machine communication that you would have on your local network. It automatically dials out as required and can automatically hang up after a pre-set idle period. Pre-written scripts support many of the most popular modems (up to 38.4kbps) and the scripting language allows you to add others. Teleconnect can be configured to dial out and answer calls, so other machines can exchange data (such as mail) with yours in your absence. For example, you could have your office NeXTmail periodically transferred to your home. Truly a total communications solution.

Marble Associates
1012 Teleconnect **$249.**
4096 Teleconnect *(student version)* **125.**

Objective DB To

A database manager's best f
Designer for SYBASE automate
parts of the design and mainten

The highly visual and interacti
new database elements from ex
procedures. It will even help yo
databases and check the consis
with existing triggers and store

Best of all, you can work nor
your database changes when e
gone home, you can write the r
apply them at the end of the da

And for the developer... Ver
Toolkit links the SQL server wi
speeds the link between your a
database engine. A true NeXT
text, image, and sound data an
as buttons and slider arrays.

The Toolkit is a versatile inter
modify a database easily. It will
up automatic data transfers, ar
of SQL inserts and updates. It
gual applications.

Professional Software
4730 Objective DB Designer 1
9357 Objective DB Toolkit 2.0

Word

The NeXT step in word pe
trate on your writing and not y
just the ticket. Whatever form
newsletters, brochures, corre
you care to create, WordPerfe
use that help keep your thoug
word processor offers: colum
powerful macros, merge (mai
of contents, indexing, footnot
Questions? Ask the Digital Li
reference manual. When it's
work with the 115,000-word
with the comprehensive thes

WordPerfect easily integrat
turn newsletters or direct ma
turners). You can place graph
or borders anywhere on a pa
a paragraph, or placed in a h
and rotate them in myriad wa
automatic timed backup will
This is full-featured word pro

WordPerfect ... 60 day
8818 WordPerfect 1.0.1 ...
8859 WordPerfect 1.0.1 *(5 p*
8928 WordPerfect 1.0.1 *(20*

No foam peanuts. We use 100% recycled paper to pack.

SIMSON00000931

ProModems

ommunicating! You won't
our NeXT computer than the
os data/9600 bps send/
compatible, this true V.32bis-
speed connections of 14,400
hput utilizing V.42bis/MNP 5
ection!
s? With the Ultima, you can do
. The Ultima supports the new
, ensuring compatibility with
XT operating system. The
'll be able to use the Ultima
in the future.
nd you don't require such a
Modem 24/96NSR *Plus*
et all the same fax capabilities
on which, with V.42bis/MNP 5,
throughput. And both are
n a company whose only

anty
s 14.4 Modem)..... **$769.**
s (incl. 2400 Modem).. **339.**

NNECT

th Marble **Teleconnect**.
or telestudent, or work in a
nected to *all* the resources of
single remote computer. With
e your company mail system,
ased applications—all the
're tied to the umbilical of a
break free! Now, Teleconnect
) on your NeXT computer over
ve you access to applications
t or global Internet.
unicate with any computer run-
onnecting two NeXT computers,
er-machine communication that
twork. It automatically dials out
ally hang up after a pre-set idle
ort many of the most popular
the scripting language allows
can be configured to dial out
hines can exchange data (such
ence. For example, you could
odically transferred to your
tions solution.

..... **$249.**
ion) **125.**

Objective DB Toolkit/Designer

A database manager's best friend. The new **Objective DB Designer** for SYBASE automates and eases some of the trickier parts of the design and maintenance of databases.

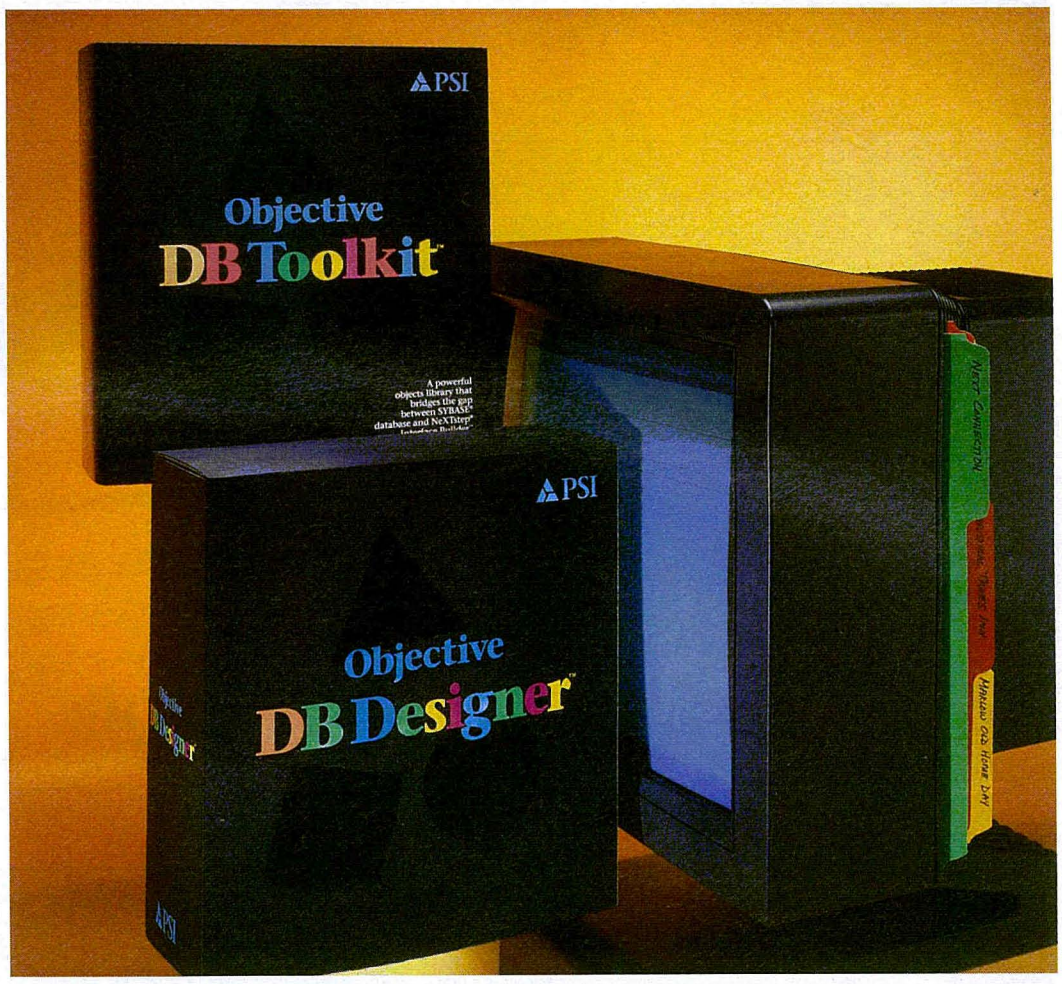
The highly visual and interactive interface allows you to create new database elements from existing ones and define backup procedures. It will even help you change the data type in active databases and check the consistency of renamed elements with existing triggers and stored procedures.

Best of all, you can work normal hours. Instead of making your database changes when everyone else has signed off and gone home, you can write the needed changes to a file and just apply them at the end of the day. (Available 1st Quarter 1992.)

And for the developer... Version 2.0 of the **Objective DB Toolkit** links the SQL server with the Interface Builder and speeds the link between your applications and the SYBASE database engine. A true NeXT database tool, it accommodates text, image, and sound data and supports pop-up lists as well as buttons and slider arrays.

The Toolkit is a versatile interface that lets you define and modify a database easily. It will help you create triggers and set up automatic data transfers, and can generate the data portion of SQL inserts and updates. It will even help you create multilingual applications.

Professional Software
4730 Objective DB Designer 1.0..... **$599.**
9357 Objective DB Toolkit 2.0 **895.**

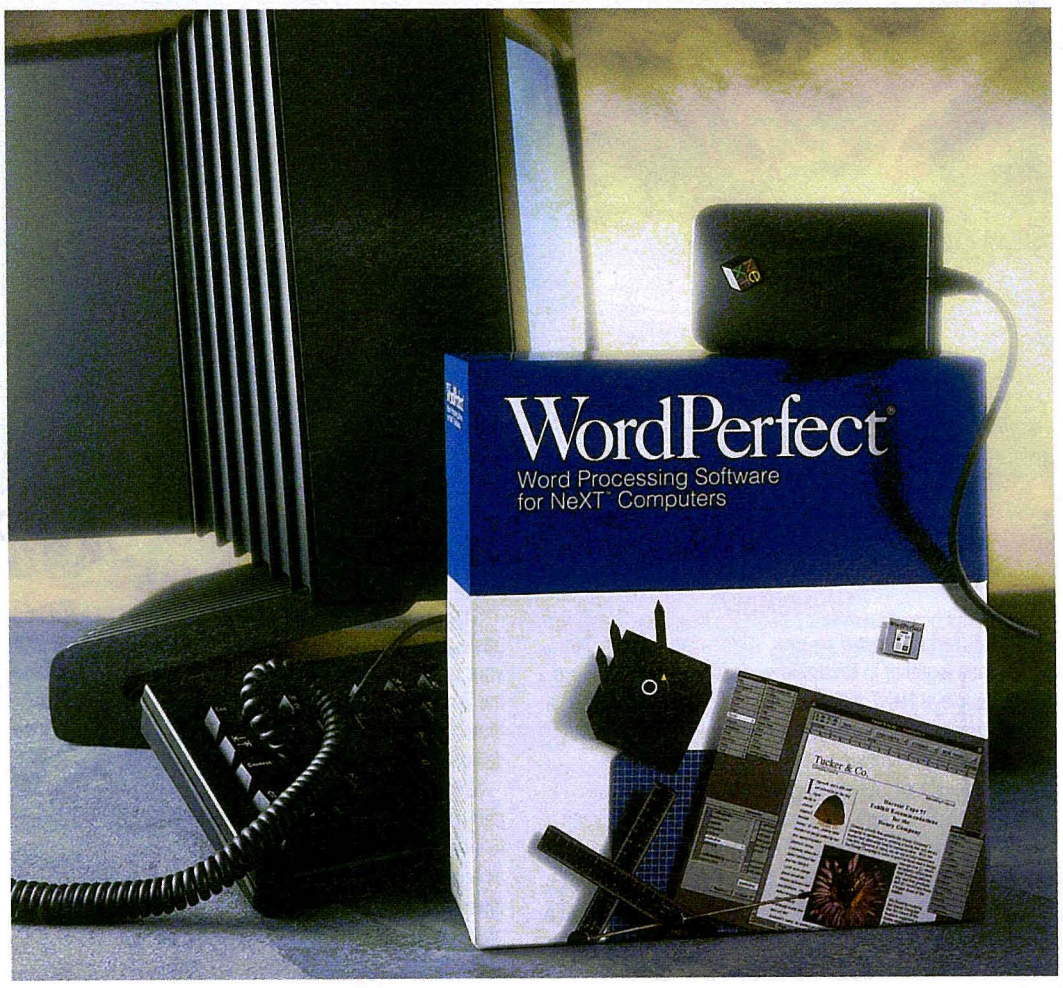


WordPerfect

The NeXT step in word perfection. If you want to concentrate on your writing and not your software, **WordPerfect** is just the ticket. Whatever form your writing takes: professional newsletters, brochures, correspondence, reports, or anything you care to create, WordPerfect has the features and ease of use that help keep your thoughts flowing. This full-featured word processor offers: columns (newspaper and parallel), powerful macros, merge (making mass mailings simple), table of contents, indexing, footnotes/endnotes, and much more. Questions? Ask the Digital Librarian or consult the on-line reference manual. When it's all said and done, check your work with the 115,000-word speller, or explore better wording with the comprehensive thesaurus.

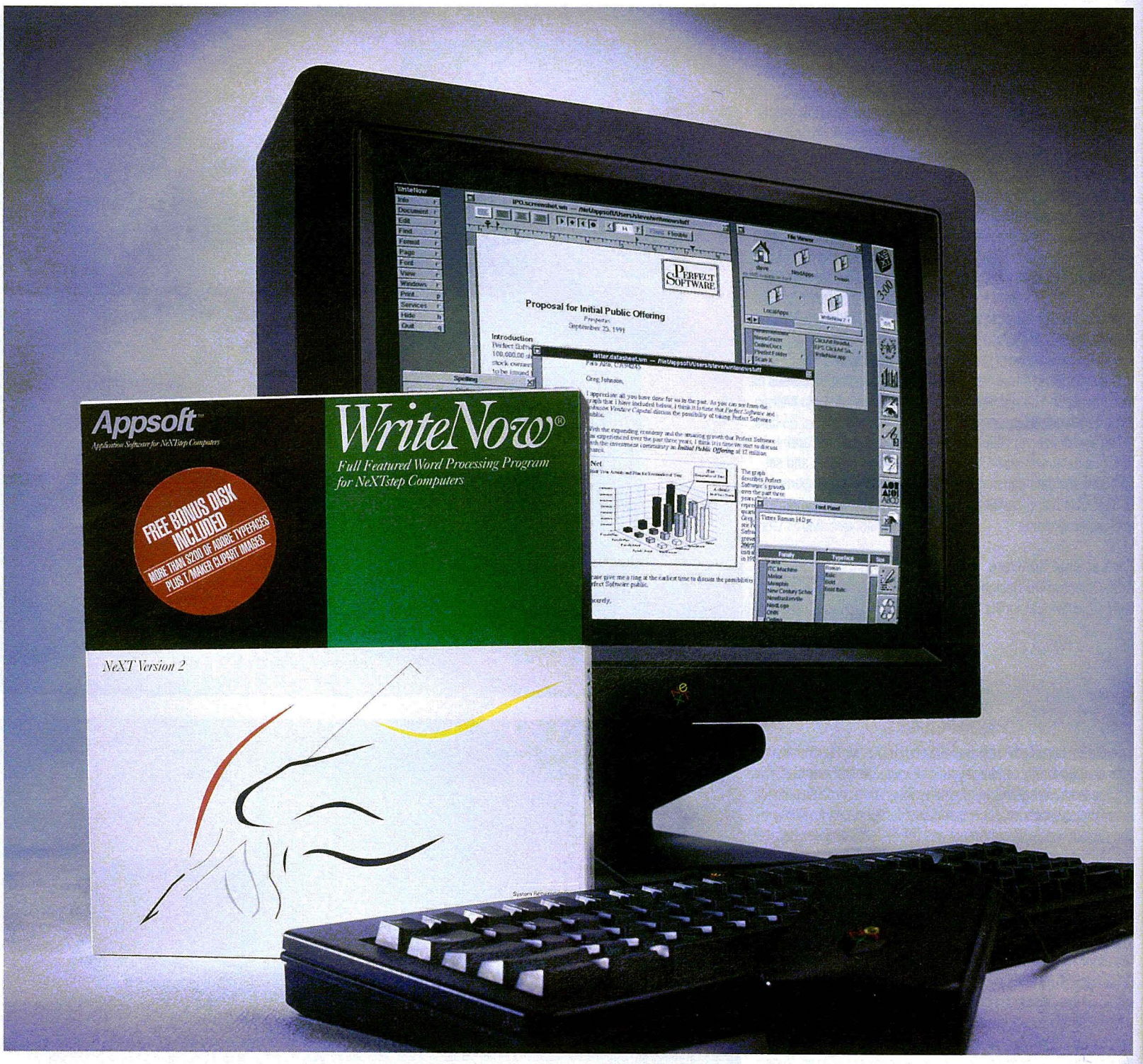
WordPerfect easily integrates text and graphics, so you can turn newsletters or direct mailings into head-turners (and page-turners). You can place graphic images complete with captions or borders anywhere on a page (inserted in a line of text, tied to a paragraph, or placed in a header or footer) and scale, move, and rotate them in myriad ways. And to protect your work, the automatic timed backup will save your work at regular intervals. This is full-featured word processing for NeXT computers.

WordPerfect ... 60 day MBG
8818 WordPerfect 1.0.1 **$299.**
8859 WordPerfect 1.0.1 *(5 pack)*..... **1249.**
8928 WordPerfect 1.0.1 *(20 pack)*..... **3699.**



Call 1-800/800-NeXT to order.

NeXTConnection™



NeXT'S MOST POPULAR WORD PROCESSOR.

WRITENOW

Full-featured and easy-to-use. A rare combination, but it all comes together in **WriteNow**, developed for NeXTstep by the people at NeXT. WriteNow's use of the NeXT graphical user interface makes word processing simple and intuitive, along with plenty of powerful features that allow you to create professional-looking documents instantly.

Use WriteNow's rulers to format your document paragraph by paragraph or, if you prefer, all the pages at once. The WYSIWYG (what you see is what you get) interface lets you see the results each step of the way. And for those high-impact headlines, the NeXT font panel allows you to apply as many fonts as you may need.

Since a picture is worth a thousand words, just copy and paste an informative graph or other piece of artwork in from your favorite draw or paint program. Once inside WriteNow, the image can be aligned, stretched, or scaled to your dimensions. Working with WriteNow is so easy, you'll never settle for anything less.

WriteNow's automated functions allow you to create perfect documents every time. Use WriteNow's spell checker to inspect your creative prose. Place headers & footers on all or just some of the pages. Add footnotes for special references. And use the search and replace commands to make changes—quickly and efficiently. WriteNow has enough power and versatility to be used for all your word-processing needs, from simple form letters to complex multi-column newsletters.

Looking for something special? Like, for instance, multi-column formatting, mail merge, programmable data merge, spell checking, bold/italic/underline text formatting, footnotes, headers and footers, search and replace, character and word counting, automatic page numbering and date insertion...whew! WriteNow, the full-powered word processing program developed specifically for NeXTstep, has it all.

Appsoft ... 60 day MBG

4128 WriteNow 2.1 **$159.**
4997 WriteNow 2.1 *(5 Pack)* **739.**

Call us anytime from: 8:00 a.m. Monday thru midnight Friday.



THE

APPSOF

For professional-looking bus
Appsoft Draw's easy-to-use inte
tools, and multi-page capabilities
presentations, informative flyers,
in a flash.

Appsoft Draw's comprehensive
of drawing tools for fast and inter
arcs, rectangles, polygons, 24-bi
images, beziers and more. Comb
stunning artwork—including ever
organizational charts to business

Now use Appsoft Draw's text to

SIMSON00000932

SIMSON00009333

NeXTConnection™



THE BUSINESS GRAPHICS SOLUTION FOR NeXTstep.

APPSOFT DRAW

For professional-looking business graphics. With **Appsoft Draw**'s easy-to-use interface, powerful drawing tools, and multi-page capabilities, you'll be creating effective presentations, informative flyers, and multi-page newsletters in a flash.

Appsoft Draw's comprehensive tool palette offers a host of drawing tools for fast and interactive control of lines, arcs, rectangles, polygons, 24-bit color, TIFF and EPS images, beziers and more. Combine these objects to create stunning artwork—including everything from company organizational charts to business presentations.

Now use Appsoft Draw's text tools to enter and manipulate your text headlines and body copy. Change text fonts, stroke, width, kerning, and justification. Scale and rotate your text to any size or angle. Working with Appsoft Draw is so easy, you'll never settle for second best.

And, to make it even easier while creating those high-impact presentations, Appsoft Draw offers a variety of drawing effects. Apply three-dimensional gradient fills, attention-getting arrowheads, solid or dashed lines, and/or separate stroke and fill colors; or set adjustable brightness and contrast levels of TIFF and EPS images.

Once you're finished with your artwork, output to any PostScript printer or imagesetter to create high quality color or black & white prints and slides. And since they run under NeXTstep, you can be sure that all Appsoft programs provide state-of-the-art compatibility and true work group productivity.

With Appsoft Draw at your fingertips, you'll be producing top-quality forms, illustrations, maps, presentations, slides and more—accurately and automatically. For the business professional, Appsoft Draw removes the tedium between inspiration and presentation.

Appsoft ... 60 day MBG
4465 Draw 2.0 **$309.**

Call 1-800/800-NeXT to order.

form letters to complex

al? Like, for instance, multi-
, programmable data merge,
rline text formatting, foot-
urch and replace, character
page numbering and date
e full-powered word process-
cally for NeXTstep, has it all.

..... **$159.**
..... **739.**

Corporate Accounts Welcome

Yes, we gladly accept P.O.s. Always have, always will. In fact, we do everything possible to make corporate mail-order purchasing of computer software and peripherals as easy and enjoyable a process as possible—within the realm of common decency, of course. Many companies (including most of the Fortune 1000 and other just-as-fortunate smaller ones) have accounts with us. If you'd like to open one (or check whether your company already has one), simply call our order line at 800/800-NeXT.

PRODUCT INDEX

GENERAL BUSINESS & PRODUCTIVITY

Adamation ... 30 day MBG
(See page E)
3357 Who's Calling? 2.0 $395.
Appsoft ... 60 day MBG
(See page O & P)
4128 WriteNow 2.1 159.
4997 WriteNow 2.1 *(5 pack)* 739.
4465 Draw 2.0 309.
DIT ... 1 year warranty
(See page K)
8657 On Duty 1.0 209.
Imagine, Inc.
(See page E)
1396 MediaStation 2.0 495.
1397 MediaStation 2.0 *(5 pack)* 2995.
1398 MediaStation 2.0 *(20 pack)* 8995.
1400 MediaStation Educational Package 2.0 ... 295.
1394 MediaStation Educ./Ntwk. Pkg. 2749.
Lotus Development
(See page C)
9794 Improv 1.0 549.
WordPerfect ... 60 day MBG
(See page N)
8818 WordPerfect 1.0.1 299.
8859 *(5 pack)* 1249. 8928 *(20 pack)* 3699.

COMMUNICATIONS & DATA TRANSFER

Marble Associates
(See page M)
1012 Teleconnect 249.
4096 Teleconnect *(student version)* 125.
DataViz ... 60 day MBG
1823 MacLinkPlus/PC 6.0 129.
DIT ... 1 year warranty
(See page K)
8656 FloppyWorks 2.2D 69.
Dove Computer ... 1 year warranty
9356 DoveFax Desktop NeXT *(includes 2400 modem)* 395.
Hayes ... 2 year warranty
(See page L)
2307 Smartmodem 2400 *(requires cable)* 349.
5991 V-Series 9600 Modem *(requires cable)* 539.
7391 Ultra 9600 Modem *(requires cable)* 669.
4998 ISDN System Adapter *(requires cable)* ... 1199.
Insignia Solutions
(See page D)
1456 SoftPC 2.05 329.
Intel ... 5 year warranty
(See page G)
5119 2400EX Modem *(requires cable)* 169.
7880 9600EX Modem *(requires cable)* 469.
3864 14.4EX Modem *(requires cable)* 549.
Prometheus ... 2 year warranty
(See page M)
2207 ProModem Ultima *(includes 2400 Modem)* $339.
2197 ProModem 9600 NSR *Plus* *(includes 14.4 Modem)* 769.
Software Ventures ... 30 day MBG
(See page K)
4759 MicroPhone II 1.0 149.
Telebit ... 1 year warranty
8907 T2500 Modem *(requires cable)* 939.

PUBLISHING & GRAPHICS

Item#	*Manufacturer*	*Price*
	Adobe Systems	
	(See page I)	
1827	Adobe Illustrator 3.0	459.
9765	Adobe Plus Pack 1.0	129.
9741	Adobe TouchType 1.0	175.
1832	Adobe TypeSet 1 or 1833 TypeSet 2	*ea.* 65.
1834	Adobe TypeSet 3	129.
	Adobe fonts now available:	
4767	Aachen, Revue	125.
4801	Adobe Caslon	179.
4754	Adobe Garamond	179.
4747	Adobe Wood Type 2	125.
4745	Bodoni	179.
4800	Caslon Expert	179.
4771	Century Old Style	95.
4775	Copperplate Gothic	239.
4760	Futura 1 or 4758 Futura 2	*ea.* 179.
4738	Garamond 3	125.
4783	Gill Sans 1 ... 179. 4772 Gill Sans 2	125.
4739	Goudy Old Style	125.
4734	Helvetica Condensed	239.
4746	Helvetica Nueue	179.
4757	Helvetica Nueue 1	125.
4731	ITC Fenice	239.
4778	ITC Garamond Condensed	239.
4782	ITC Garamond 2	125.
4776	Lithos	125.
4779	Minion	239.
4749	Mistral, Reporter	95.
4768	News Gothic	125.
4774	Nuptial, Cascade, Medici	95.
4773	Optima	125.
4736	Sonata	63.
4777	Tekton	125.
	Lighthouse Design, Ltd. ... 60 day MBG	
	(See page H)	
8621	Diagram! 1.1	339.
8663	Big Green Disk *(optical disk only)*	299.
	MicroMaps ... 30 day MBG	
	(See page J)	
9276	MapArt 1.0	95.
2337	MapArt 1.0 *(CD-ROM)*	95.
	Rightbrain Software ... 30 day MBG	
	(See page J)	
4496	TypeView 1.0	99.
	T/Maker ... 30 day MBG	
1185	ClickArt 1.0	195.

UTILITIES

Agog, Inc. ... 30 day MBG
1476 Squash! 1.0 $79.
1478 Squash! 1.0 *(10 pack)* 699.
1479 Squash! Educational 1.0 49.
1481 Squash! Educational 1.0 *(10 pack)* 429.
Rightbrain Software ... 30 day MBG
(See page G)
4148 LockScreen 3.2 79.
4493 LaunchPad 79.
4498 Portfolio 79.
4494 Rulers 79.
Teledia
(See page J)
2513 Backup Master 1.0 249.
2514 Phrase Player 2.0 129.
4726 FileMaster 1.0 299.

PROGRAMMING & MATH TOOLS

Absoft
8898 Fortran 77 3.0 839.
Objective Technologies
9347 [OT Palettes: 2.0] Chooser 429.
9346 [OT Palettes: 2.0] Math 650.
9345 [OT Palettes: 2.0] SmartField 650.
9344 [OT Palettes: 2.0] Graph 1259.
Professional Software
(See page N)
4730 Objective DB Designer 1.0 599.
9357 Objective DB Toolkit 2.0 895.
Triakis ... 30 day MBG
1963 T-Calc 1.0 59.
1965 Math++ 3.0 199.
1966 DAN, the Data ANalyzer 2.0 269.
Wolfram Research ... 30 day MBG
2516 Mathematica 2.0 1295.

RECREATIONAL

Athena Design ... 30 day MBG
9457 Culture Shock 1.0 22.
3876 Culture Shock 1.0 *(color)* 25.
David S. Joerg Productions ... 30 day MBG
4846 Ragnarok 39.
Lighthouse Design, Ltd. ... 60 day MBG
(See page J)
3315 Void 2.0 *(3 user license)* 99.

VIDEO & SOUND

Metaresearch ... 1 year warranty
9682 Digital Ears 499.
9683 Digital Ears *(with Soundworks)* 669.
9681 Digital Eye *(monochrome)* 829.
4848 Color Digital Eye 995.
9680 SoundWorks 2.0 269.

Call 1-800/800-NeXT to order.

INPUT/OU

Abaton ... 1 year wa
8620 300/GS Scanner *(requ*
9449 Interface Kit *(for 300/G*
American Power ...
7105 Smart-UPS 600
9365 Smart-UPS 900
9364 Smart-UPS 1250
9366 Smart-UPS 2000
7107 Back-UPS 450
3823 Back-UPS 600
7110 Back-UPS 800
7109 Back-UPS 1200
Kensington ... 1 ye
4971 Modem/Fax Protector
4972 Power Tree 10
4973 Power Tree 20
4974 Power Tree 50
5577 PowerBacker 450 (2 y
5578 PowerBacker 520 (2 y
5230 PowerBacker 800 (2 y
5228 PowerBacker 1200 (2
Safe Power Systems
1948 PowerBacker 300 ...
6747 400S Power Backup.
7913 650 VA Backup
Tripp Lite ... 2 yea
7890 750W Battery Backup
7889 1200W Battery Backu
6018 LC1200 Line Conditio
6017 LC1800 Line Conditio

DRIVES &

All drives requir

Cables ... lifetime
8908 SCSI 1-50 Pin Centro
8906 SCSI 2-50 Pin Centro
8909 50 Pin-50 Pin Centro
1106 SCSI Terminator ...
8992 68030 Modem Cable
8991 68040 Modem Cable

OU

- We accept VISA and MA
- No surcharge will be ad
- Your card is not charged
- If we must ship a partial complete the order (in th
- No sales tax is charged,
- All U.S. shipments insure
- International orders U.S
- Manufacturer support a
- Upon receipt and appro immediate shipment of
- Corporate P.O.s are acc
- C.O.D. max. $1000. Ca
- 120-day limited warrant
- Defective software repla our discretion. All items to change without notic
- Order lines: Open cont Business offices: Call 6

SIMSON00000934

SIMSON00000935

NeXTConnection™

INPUT/OUTPUT

Abaton ... 1 year warranty

8620 300/GS Scanner *(requires Interface Kit)* . . $995.
9449 Interface Kit *(for 300/GS)*. 475.

American Power ... 2 year warranty

7105 Smart-UPS 600 425.
9365 Smart-UPS 900 669.
9364 Smart-UPS 1250 879.
9366 Smart-UPS 2000 1339.
7107 Back-UPS 450 235.
3823 Back-UPS 600 299.
7110 Back-UPS 800 599.
7109 Back-UPS 1200 799.

Kensington ... 1 year warranty

4971 Modem/Fax Protector 20 25.
4972 Power Tree 10 19.
4973 Power Tree 20. 27.
4974 Power Tree 50. 54.
5577 PowerBacker 450 *(2 year warranty)*. 299.
5578 PowerBacker 520 *(2 year warranty)*. 349.
5230 PowerBacker 800 *(2 year warranty)*. 649.
5228 PowerBacker 1200 *(2 year warranty)*. 829.

Safe Power Systems ... 2 year warranty

1948 PowerBacker 300. 199.
6747 400S Power Backup. 399.
7913 650 VA Backup 459.

Tripp Lite ... 2 year warranty

7890 750W Battery Backup 469.
7889 1200W Battery Backup 669.
6018 LC1200 Line Conditioner 159.
6017 LC1800 Line Conditioner 209.

DRIVES & CABLES

All drives require a SCSI cable.

Cables ... lifetime warranty

8908 SCSI 1-50 Pin Centronics 12.
8906 SCSI 2-50 Pin Centronics *(4 ft.)*. 45.
8909 50 Pin-50 Pin Centronics 15.
1106 SCSI Terminator 29.
8992 68030 Modem Cable *(8 ft.)*. 15.
8991 68040 Modem Cable *(8 ft.)*. 15.
1540 Mini DIN 8 to Mini DIN 8 Null Modem Cable $15.
1441 Mini DIN 8 to DB25 Null Modem Cable. 15.

DIT ... 1 year warranty

(See page K)

8661 CubeFloppy 2.9 *(with FloppyWorks 2.2D)* . 579.

IOMEGA ... 1 year warranty

(See page F)

2530 Bernoulli 90 MB Cartridge 149.
2467 Bernoulli 90 MB Tri-Pack. 439.
2224 Bernoulli 90 MB Transportable Drive. 799.
2481 Care Kit 49.

Micropolis ... 5 year warranty

(See page G)

8984 280 MB MicroDisk *(formatted capacity)* . . 1589.
4415 550 MB MicroDisk *(formatted capacity)* . . 1889.
4412 860 MB MicroDisk *(formatted capacity)* . . 2599.
8978 550 MB Int. Hard Drive *(15 ms)*. 1449.
5029 860 MB Int. Hard Drive *(15 ms)*. 2159.

Peripheral Land, Inc. ... 1 year warranty

(See page L)

8887 CD-ROM Caddy *(single)*. 14.
2531 CD-ROM Caddy *(10 pack)* 99.
8899 CD-ROM Drive. 749.
8890 1.2 GB External Hard Drive *(15 ms)* 3295.
8891 320 MB External Hard Drive *(11 ms)*. 1895.
8892 635 MB External Hard Drive *(12 ms)*. 2879.
8888 330 MB External Hard Drive *(17 ms)*. 1749.
8889 600 MB External Hard Drive *(17 ms)*. 2095.
8893 Infinity 40 MB Cartridge Drive. 669.
8894 Infinity Twin 40 MB Cartridge Drive 1195.
8905 SCSI 2 to Centronix Cable *(50 pin)* 49.
8547 SuperFloppy 2.88 449.
4847 Infinity 88 Turbo 879.
8888 300 MB Hard Drive. 1749.

ACCESSORIES

Avery ... 60 day MBG

4812 1/2" x 1 3/4" Laser Labels *(Qty. 2000)* 7.
4807 1" x 2 5/8" Laser Labels *(Qty. 3000)* 24.
4808 1 1/3" x 4" Laser Labels *(Qty. 1400)* 24.

Canon ... 90 day warranty

9811 512 MB Optical Disk *(MO-502m)*. 175.

Curtis Manufacturing ... lifetime warranty

1718 3.5" Disk File *(DB-2) (holds 40)* $8.
9757 Top Shelf *(TS-1)* 18.
5985 Safe Fax *(SF-1) (1 year warranty)*. 19.
1713 Filtered Safe Strip *(SPF-3) (1 year warranty)*. . 24.
1707 Ruby *(SPF-2)* 55.
1708 Ruby Plus *(SPF-2+)* 65.
5832 Ruby Remote *(SPFR-2)* 65.

Hewlett-Packard ... 120 day warranty

8099 Toner Cartridge for NeXT Printer. 95.

Memory ... 2 year warranty

1 MB SIMM *(80ns)* 49.
1 MB SIMM *(80ns, set of 4)*. 169.
4 MB Memory Upgrade Kit. 159.
8 MB Memory Upgrade Kit *(for NeXTstation Color & NeXTdimension)* 599.
16 MB Memory Upgrade Kit. 599.

Moustrak ... lifetime

8576 Mouspad: black *(7" x 9")* 8.
2694 Mouspad: blue *(7" x 9")* 8.
2699 Mouspad: gray *(7" x 9")* 8.
8548 Mouspad: black *(9" x 11")*. 9.
2692 Mouspad: blue *(9" x 11")* 9.
2697 Mouspad: gray *(9" x 11")* 9.
2693 Moustrak L/F: blue *(9" x 11")*. 10.
2698 Moustrak L/F: gray *(9" x 11")*. 10.

Pacific Micro ... 1 year warranty

8244 External Hard Drive Enclosure 469.

Sony ... 60 day MBG

(See page G)

3298 3.5" High Density Disks *(10 pack)* 15.
6375 3.5" High Density Disks *(30 pack)* 42.
3614 3.5" Extra-High Density Disks *(10 pack)*. . . . 65.
5030 3.5" Extra-High Density Disks *(20 pack)*. . . 126.

SyQuest ... 60 day MBG

6592 SyQuest Cartridge *(44 MB)*. 72.
9728 SyQuest Cartridge *(44 MB, 10 pack)*. 689.
3603 SyQuest Cartridge *(88 MB)* 119.
3600 SyQuest Cartridge *(88 MB, 10 pack)*. 1099.

Toshiba ... lifetime warranty

(See page L)

9754 Toshiba 3.5" ED Floppy Disk *(single)* 7.
4858 Toshiba 3.5" ED Floppy Disks *(5 pack)*. 30.
9755 Toshiba 3.5" ED Floppy Disks *(10 pack)*. . . . 59.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge will be added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax is charged, except for Ohio residents (please add applicable tax).
- All U.S. shipments insured, no addtn'l charge. APO/FPO orders shipped 1st Class Mail.
- International orders U.S. $250 minimum.
- Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s are accepted subject to credit approval.
- C.O.D. max. $1000. Cash or certified check.
- 120-day limited warranty on all products.
- Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items are subject to availability. Prices and promotions are subject to change without notice.
- Order lines: Open continuously from 8:00 a.m. Monday until midnight Friday, ET. Business offices: Call 603/446-7771 Monday thru Friday 9:00 a.m. to 5:30 p.m. ET.

SHIPPING

Continental U.S.:
Barring events beyond our control, all credit card orders phoned in weekdays by 3:15 a.m. ET will ship Airborne Express for delivery the next business day. Which means *same day* delivery for orders placed between midnight and 3:15 a.m. ET. (Some orders may ship by UPS Ground for next day delivery.) Saturday delivery is available to many areas upon request. Some areas require an additional day for delivery. The total freight charge on any non-C.O.D. order placed with NeXTConnection is only $3. C.O.D. orders will ship for $8.

Hawaii, Alaska, Canada, Puerto Rico, and U.S. Virgin Islands:
Call 800/800-NeXT for information on shipping and charges.

All other areas:
Call 603/446-7771 or FAX 603/446-7926 for information.

©Copyright 1991 PC Connection, Inc. NeXTConnection is a division of PC Connection, Inc., Marlow, NH. NeXTConnection is a trademark of PC Connection, Inc. and NeXT Computer, Inc. "NeXT" is a service mark of NeXT Computer, Inc. and is used under license. NeXTConnection is not affilliated with NeXT Computer, Inc. All other trademarks remain the property of their respective companies.

NeXTConnection™
9 Mill Street, Marlow, NH 03456 1-800/800-NeXT 603/446-7771 FAX 603/446-7926

Call 1-800/800-NeXT to order.

USERS

Default Fonts in WordPerfect

by SUSAN GRIST

Everyone has a favorite font, and many businesses have a corporate font, in which all correspondence should be styled. If yours doesn't happen to be Helvetica, and you use WordPerfect, you can save yourself the trouble of changing the font in each document by changing WordPerfect's default font. In fact, you can do it in one of two different ways.

If you're the type that likes variety, having a choice of methods is good; if you're partial to predictable results, you could be in trouble. Both approaches – the Styles command, or the combination of the Preferences and Initial Font commands – work well on their own, but they do not work together. Using Styles even once disables the Preferences and Initial Font options permanently, so you've got to pick your method carefully.

Styles

The Styles command in the Format menu allows you to specify a default font for all new documents or a default font for the current (active) document. Setting a default font for all documents with the Styles command sets the default font for all areas of all new documents: body text, headers and footers, page numbers, footnotes, and endnotes.

The panel that appears when you select Styles offers two options: Default or Document (Figure 1). Now remember, use this method only if you are sure you want to use Styles, and only Styles, from now on. To specify a default font for all new documents, select Default (the Document option is for setting a font only for the current document). Next, select Edit from the Operations pull-down menu. An Initial Settings window appears. Choose Font panel from the Font menu and select the font you like from the standard Font panel that appears. Click OK. Notice that the WordPerfect code for the new font is now displayed in the bottom half (the Inspector portion) of the Initial Settings window. Click Exit Initial Settings to return to your document.

You can choose a font for only the current document by choosing

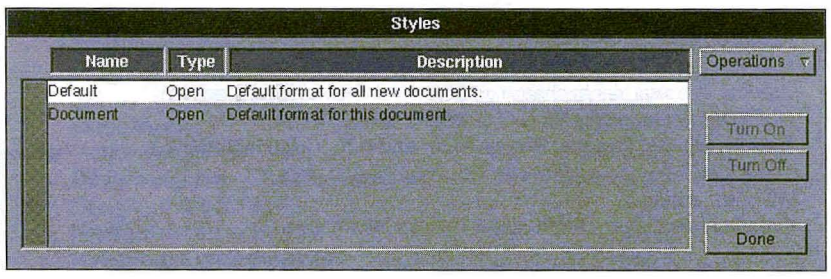


Figure 1. **WordPerfect's Styles command allows you to set a font for all new documents (by choosing Default) or just the current document (by choosing Document). The Styles settings override choices made with the Preferences and Initial Font options.**

the Document option from the Styles panel, then selecting a font in the same way.

The font defined as a default for all new documents through Styles overrides any other default font definitions. (You can override this, or any other default setting, when working within a single document, by selecting text and applying fonts in the usual way.)

Preferences

The Preferences command in the Info menu is another way of setting a default font for all new documents. Hold down the button at the top of the Preferences panel and select Document. At the top left of the Document Preferences panel is an area in which to define an Initial font (Figure 2). Clicking the Font Panel button calls up the standard Font panel, from which you can choose a font.

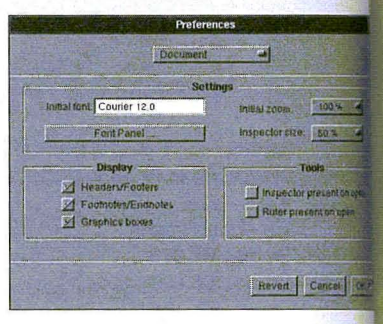


Figure 2. **The Document Preferences panel enables you to set an Initial font for all new documents, unless you have previously set a default with Styles.**

The font selected through the Preferences panel will be used for all new documents – unless you've chosen another default font with the Styl command. If you have ever specified a default font for all documents through Styles, it doesn't matter what you enter here in Preferences – it will be overridden by the Styles font definition. Unfortunately, WordPerfect doesn't inform you when there is a conflict between the font you define through Styles and the font you define in Preferences; it simply ignores what you define in Preferences.

Initial Font

The third way to affect default fonts is through the Initial Font command. This command, like the Document option in the Styles panel, is intended for use when you want to make an exception to your default font definition and don't want to change the default font for all documents.

To find the Initial Font option, choose Format, then Document, then Initial Font. Once again, you choose the font you want from the standard Font panel, which you call up with a button in the Initial Font panel (Figure 3). The font you specify will be the default font for all areas of your current document. It won't affect any other documents you open; when you open a new document, WordPerfect sets the Initial Font to be the font defined in Preferences.

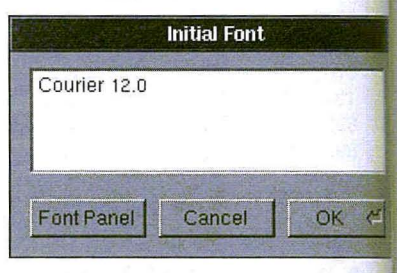


Figure 3. **The Initial Font command affects only the current document. If you've previously used Styles to set a default, WordPerfect ignores the Initial Font setting.**

Once again, though, WordPerfect ignores the setting, even for the current document, if you have ever set the default font for all documents through Styles. And again, WordPerfect does not inform you that there's a conflict; it simply ignores your new setting. Initial Font works in tandem with the Preferences setting: Each overrides the other within its own scope, and both crumble under the power of Styles.

Currently, the only good way to set default fonts is to ignore the benefits of variety and choose one approach or the other. WordPerfect says the conflict is an inadvertent result of its port from the DOS version of the program. Clearly, it's an area WordPerfect needs to pay attention to. Meanwhile, caveat formatter.

SUSAN GRIST *is president of HCI Consultants in Herndon, Virginia, a firm specializing in user interface design and evaluation, as well as systems training.*

USERS

Hints and Tips

by CHUCK FARNHAM & SUSAN GRIST

Settings window that appe
the bottom half an inspect
setting them up in the doc
document.

To change your defau
Settings window by choos
the justification, zoom size
their respective buttons or
positions. Once you have
at the top of this window.
in WordPerfect, it will ha
just specified. You can alv
(using the Font panel and
the defaults when you op

Page numbering. If you us
in the Format menu) to se
or footer in the same area
number. To avoid this pro
header or footer text by u
header or footer window
to appear.

FrameMaker

Tables within tables. One
to put a table within a ta
point into a cell and try t
"You cannot insert a tab

1. Put the insertion p
table to appear.

2. Choose Special/A
you want the second tab
Current Line and Center
off before clicking New

3. A new anchored f
tion point was. The cell
wider than the cell you v

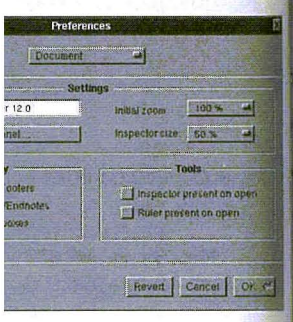
4. Click on the Text
column inside the new a

Now you can put yo
created and insert a tabl

Incrementing bug. In Fra
numbered paragraphs th
anchored frames from i
is to send the text colum

SIMSON00000936

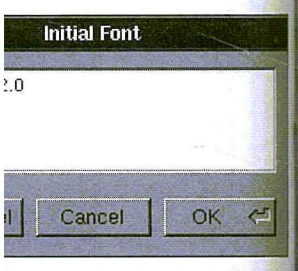
SIMSON0000093Z



Document Preferences panel set an Initial font for all new unless you have previously set a tyles.

nel will be used for all default font with the Styles ont for all documents here in Preferences – it Unfortunately, Word- lict between the font you Preferences; it simply

he Initial Font command. ie Styles panel, is intended your default font defini- or all documents. t, then Document, then want from the standard



Initial Font command affects only ocument. If you've previously used default, WordPerfect ignores the tting.

efault font for all docu- loes not inform you that ing. Initial Font works in ides the other within its of Styles. t fonts is to ignore the he other. WordPerfect says om the DOS version of eeds to pay attention to.

ltants in Herndon, esign and evaluation,

USERS

Hints and Tips

by Chuck Farnham & Susan Grist

WordPerfect

More styles. The Styles command in the Format menu allows you to define default font and ruler settings in addition to default fonts. Select Styles from the Format menu, click Default, and select Edit from the Operations pull-down menu. In the Initial Settings window that appears, the top half is a document window, the bottom half an inspector. You can set any formatting defaults by setting them up in the document window as you would in any other document.

To change your default ruler settings, display a ruler in the Initial Settings window by choosing Format and then Show Ruler. Then change the justification, zoom size, spacing, and columns settings by clicking their respective buttons on the ruler and dragging them to the desired positions. Once you have changed the settings, click Exit Initial Settings at the top of this window. Now, every time you open a new document in WordPerfect, it will have the default font and ruler settings you have just specified. You can always change these settings within a document (using the Font panel and ruler); these new settings will simply be used as the defaults when you open a new document.

Page numbering. If you use the Layout command (via the Page command in the Format menu) to set page numbers, and also define a header or footer in the same area, the header or footer will overwrite the page number. To avoid this problem, insert page numbers as part of the header or footer text by using the numbering code (Control-b) in the header or footer window in which you want the page number to appear.

FrameMaker

Tables within tables. One of the most frequently asked questions is how to put a table within a table in FrameMaker 3.0. If you put the insertion point into a cell and try to insert a table, you get a message saying, "You cannot insert a table in a cell." To work around this problem:

1. Put the insertion point in the cell where you want the second table to appear.

2. Choose Special/Anchored Frame and enter the size of the frame you want the second table to appear in. Make sure the frame is Below Current Line and Centered, and that Cropped and Floating are turned off before clicking New Frame.

3. A new anchored frame appears within the cell where your insertion point was. The cell will grow taller if needed, but if the frame is wider than the cell you will need to resize the cell to fit the new frame.

4. Click on the Text Column tool in the Tools window. Draw a text column inside the new anchored frame.

Now you can put your insertion point into the text column you just created and insert a table into that column.

Incrementing bug. In FrameMaker 2.1, there was a problem with auto-numbered paragraphs that prevented numbers on text columns inside anchored frames from incrementing properly. The workaround for this is to send the text column to the back.

SoftPC

Floppies and SoftPC. There are certain technical problems related to permissions when first installing SoftPC. If you try to set the floppy in the Preferences menu and an error message appears stating that the operating system could not gain access to the real floppy device **/dev/rfdob** or **/dev/rsh1h,** you may need to use the following procedure to set read/write permissions:

1. Open a Terminal, type **su,** then press Return. You will be prompted to type the superuser's password.

2. Type **chmod 666**(*device name*). The (*device name*) is either **/dev/rfdob** or **/dev/rsh1h,** depending on whether you are using an internal or external floppy. Type the name of the device you were presented with in the error message.

3. Close the Terminal window.

Now you should be able to go back into SoftPC to configure the floppy drives.

Chuck Farnham *is a hardware-support engineer and consultant specializing in teaching computer skills to individuals with developmental disabilities.* Susan Grist *is president of HCI Consultants in Herndon, Virginia.*

USERS

NeXT Question

by Simson L. Garfinkel

Q: I received a file over MCI Mail with every line ending in a return character. How can I remove these using the Find panel in WriteNow?

Kevin H. Anderson
Kirkland, WA

A: *When you open the file in WriteNow, the program will ask if it should change carriage returns to spaces. Click No. The trick now is to get rid of the carriage returns at the end of each line while preserving those between paragraphs.*

Press Command-f to bring up the Find panel. Hold down an Alternate key and press Return three times in the Find field of the Find panel. Press Tab to move to the Replace With field and type @@@. Now click the Replace All button. This will change all of the carriage returns between paragraphs to the @@@ symbols.

Now press Command-f again, hold down the Alternate key, and press Return twice. Press Tab to move to the Replace With field and press the space bar. Click the Replace All button. This will change all of the remaining carriage return characters in the document to the space character. (MCI Mail's added carriage return gives you two carriage returns at the end of every line.)

Finally, press Command-f again. Type @@@, tab to the Replace With field, and replace the @@@ symbols with Alternate-Return. This will turn all of the @@@ symbols into paragraph breaks.

Simson L. Garfinkel *is a senior editor at* NeXTWORLD.

SYSADMIN

Strategies for Hard-Disk Management

by Seth T. Ross & Daniel Miles Kehoe

It's a tried-and-true rule of computing: There is never enough disk space. File systems relentlessly expand to fill their storage medium. This rule applies to almost every kind of computer installation, from a stand-alone NeXTstation to large networks of storage-rich NeXTcubes.

Besides making storage space scarce, filling up your disk(s) can significantly degrade your system's performance. Making matters worse, users are not often concerned with the amount of space they consume – or even aware that disk space may be limited – until they run out.

While managing hard disk resources is a challenge for every system administrator, a few simple strategies can help.

Monitoring disk usage

The first step toward sound disk management is to know how much space your system has left. Under NeXTstep 2.0, the amount of free disk space is reported in the lower left corner of the File Viewer's shelf. For a more detailed look at disk space usage, use the UNIX utilities included with every NeXT computer: **df**, **du**, and **find**.

To check the amount of free disk space on all currently mounted file systems, launch Terminal and type **df**; the program will list all of your currently mounted file systems by the name of the physical device on which they reside. It will then tell you how many kilobytes they can hold, how many are used, how many are free, the percent free, and where the file system is actually mounted.

Here is a sample of such a listing from a stand-alone Cube:

```
albion> df
Filesystem      kbytes    used     avail    capacity   Mounted on
/dev/sd0a       345542    234728   76259    75%        /
/dev/od0a       233066    194229   27183    88%        /New2Next0D
albion>
```

In this example, 234MB is used on a 345MB hard drive ("/dev/sd0a") and 194MB is used on a 233MB optical disk ("/dev/od0a"). The amount left and the percent capacity don't add up to 100 because the Berkeley Fast File System (which the NeXT uses) reserves 10 percent of the disk's space for the exclusive use of the superuser. (This is because the file system becomes very slow when the last 10 percent gets filled up.)

The following example is from *NeXTWORLD*'s internal network. All of the mounted file systems (except the first) are mounted over the network via NFS:

```
jan91> df
Filesystem      kbytes    used     avail    capacity   Mounted on
/dev/sd0a       662367    495254   100876   83%        /
smirnoff:/smirnoff_LocalApps
                662367    453886   142244   76%        /LocalApps
jan91:/jan91_Users
                662367    495254   100876   83%        /Users
jan91:/jan91_LocalLibrary
                662367    495254   100876   83%        /LocalLibrary
lebaron:/simsong
                197278    155892   21658    88%        /Users/simsong
yamaha:/yamaha_Users/dlavin
                662367    501952   94178    84%        /Users/dlavin
jan91>
```

Although this display gives you an overview, its limitation is obvious. There is no information about which files and directories (or even which users!) are filling things up so you can take specific action.

You can take a closer look at the file system with the **du** command. This command searches down from the directory that you give it, totaling the number of kilobytes contained within each subdirectory, and finally the specified directory itself. For example:

```
albion> du .
1       ./IM1
1       ./IM2
1       ./IM3
1       ./IM4
2       ./notes
9       ./planning/GRE.imp
6       ./planning/GRE~.imp
160     ./planning
426     ./stud_bk
31      ./templates
313     ./cover_art
937     .
albion>
```

If there are a lot of subdirectories though, the list can get quite long. As an alternative, **du** has a **-s** option that will simply generate a summary:

```
albion> du -s
937     .
albion>
```

But sometimes, what's really needed is a file-by-file list of where the big files are.

Using find to identify large files

You can use the UNIX **find** command to search for a file when you do not know where the file is within a directory tree. You can also use **find** to locate files larger (or smaller) than a size that you specify.

The syntax of **find**'s size option is a bit confusing because it represents size in 512-byte blocks rather than in bytes or kilobytes. To list all files on your system larger than 512KB, you could type this:

```
albion> find / -size +1000 -print
```

This tells **find** to search in the root (/) directory for all files larger than 1000 512-byte blocks. Contrary to appearances, the **-print** option does not send the results to the printer: It tells **find** to display the results of its search by printing the full pathname to the terminal when the file is located.

Instead of displaying the names of the files with the **-print** option, you can have **find** execute a UNIX command for each found file. A good candidate is the **ls** command, as in **ls -lF**. The **ls** command lists files and directories. The **-l** option displays a long listing, with the file's owner and size. The **F** option causes directories to be marked with a trailing slash (/) and executable files to be marked with a trailing asterisk (*). To execute **ls -lF** on every file greater than 512KB, type:

```
albion> find / -size +1000 -exec ls -lF {} \;
```

(**find** replaces the pair of braces with the file name of each found file.

The semicolon terminates the
because the semicolon is a spe
interpreted by the shell.)

You can use **find** to ruthl
files (created when programs
within your home directory v

```
albion> find ~ -name core -
```

To find backup files, you
remove all the .backup files (s
your home directory, use:

```
albion> find ~ -name \*.bac
```

Note that the wildcard chara
command. Always exercise c
conjunction with the **rm** com
-name * will erase many file

You should not run **find**
so much traffic that the netw
until your **find** finishes. Run

Eliminating unwanted

NeXT's software distributio
Edition alone fills about 180
safely delete many seldom- o
disk or tape). If you are man
can be consolidated on one s
the network. You can use N
if they are local. Single-user s
match an individual user's n
optical or floppy disk, or yo
retrieve them from the origi
them.

Here's a sorted list of all
Extended Edition.

```
albion> find / -size +2000
19808 /NextLibrary/Refere
16392 /private/vm/swapfil
7160 /usr/TeX/TeXdist.tar.
3232 /NextLibrary/Referer
3160 /NextLibrary/Referer
3096 /NextLibrary/Literatu
2440 /usr/dict/web2
2192 /usr/lib/libNeXT_p.a
2104 /NextLibrary/Referer
1864 /NextDeveloper/Dem
1608 /lib/libsys_p.a
1536 /usr/lib/libmusic_p.a
1496 /NextDeveloper/Dem
1448 /usr/shlib/libNeXT_s
1160 /NextLibrary/Docum
1056 /NextLibrary/Docum
albion>
```

Note that the output of the
command, which puts the e

The index files for Web
complete works, and the O

SIMSON00000938

SIMSON00000639

The semicolon terminates the **ls** command; the backslash (\) is needed because the semicolon is a special character that would otherwise be interpreted by the shell.)

You can use **find** to ruthlessly search and destroy space-hogs like core files (created when programs crash) and backup files. To remove all files within your home directory with the name core:

```
albion> find ~ -name core -exec rm {} \;
```

To find backup files, you'll need to use the wildcard character (*). To remove all the .backup files (such as those generated by FrameMaker) in your home directory, use:

```
albion> find ~ -name \*.backup -exec rm {} \;
```

Note that the wildcard character must be quoted when using the **find** command. Always exercise caution when using wildcards, particularly in conjunction with the **rm** command. Combining an **-exec rm** with a -name * will erase many files on your system.

You should not run **find** on a directory that is NFS-mounted: It creates so much traffic that the network may be all but unusable for other users until your **find** finishes. Run **find** on your server instead.

Eliminating unwanted files

NeXT's software distribution is voluminous; NeXTstep 2.0 Extended Edition alone fills about 180MB. Depending on your users' needs, you can safely delete many seldom- or never-used files (or move them to optical disk or tape). If you are managing a network, many identical directories can be consolidated on one server or group of servers and exported to the network. You can use NFS mounts to make these directories appear as if they are local. Single-user stand-alone systems can also be pared to match an individual user's needs. Unnecessary files can be transferred to optical or floppy disk, or you can live dangerously: Delete them, and retrieve them from the original system distribution disk if you ever need them.

Here's a sorted list of all files larger than 1MB on the NeXTstep 2.0 Extended Edition.

```
albion> find / -size +2000 -exec ls -1s "{}" ";" | sort -nr
19808 /NextLibrary/References/Webster-Dictionary/Dictionary.nxbf
16392 /private/vm/swapfile
7160 /usr/TeX/TeXdist.tar.Z
3232 /NextLibrary/References/Webster-Thesaurus/Thesaurus.nxbf
3160 /NextLibrary/References/OxfordQuotations/.index/index
3096 /NextLibrary/Literature/Shakespeare/.index/index.ixif
2440 /usr/dict/web2
2192 /usr/lib/libNeXT_p.a
2104 /NextLibrary/References/OxfordQuotations/.index/index.L
1864 /NextDeveloper/Demos/Guided Tour.app/TourScript/Tour.FileViewer.snd
1608 /lib/libsys_p.a
1536 /usr/lib/libmusic_p.a
1496 /NextDeveloper/Demos/Guided Tour.app/TourScript/Tour.WriteNow.snd
1448 /usr/shlib/libNeXT_s.C.shlib
1160 /NextLibrary/Documentation/NextDev/.index/index.ixif
1056 /NextLibrary/Documentation/Unix/ManPages/.index/index.ixif
albion>
```

Note that the output of the **find** command has been piped ("|") to the **sort** command, which puts the entries in descending numeric order.

The index files for Webster's dictionary and thesaurus, Shakespeare's complete works, and the Oxford quotations are huge (the actual entries are large as well). All told, the Webster's material consumes almost 34MB of disk space, Shakespeare consumes almost 11MB, and the quotations consume more than 5MB. Hard copies of these works are widely available, so you may decide to sacrifice electronic convenience for file space. The TeX distribution file is more than 7MB; this can be deleted on systems without TeX users. (If you use TeX, you can delete the distribution once you've got it installed.) Most systems don't need the Guided Tour application: Just one of its sound files takes almost 2MB of space, and all together it fills over 6MB.

The NeXT's swapfile can be a source of disk space woe. When a virtual memory system like the NeXT runs out of physical RAM, it uses swap space on the hard disk as virtual RAM. When using large amounts of swap space, the swapfile can grow. Turning your computer off and back on restores the swapfile to a smaller size – until you start using that virtual memory again.

Many of the largest files are the C library files and shared library files, including **libNeXT_p.a**, **libsys_p.a**, **libmusic_p.a**, and **libNeXT_s.C.shlib**. If you want your computer to work, leave these files alone.

After all the extras have been removed, the files you have left should look something like this:

```
16392 /private/vm/swapfile
2192 /usr/lib/libNeXT_p.a
1608 /lib/libsys_p.a
1536 /usr/lib/libmusic_p.a
1448 /usr/shlib/libNeXT_s.C.shlib
```

...for savings of over 60MB.

There are further disk space gains you can make. On nondeveloper systems, the NextDeveloper directory can be trimmed. The Apps, Demos, and Examples in this directory take up close to 22MB of disk space. Of course, you may want to spare some of the important demos, like Poker, Billiards.app, and Stealth.app.

Two other places to look for large unwanted files are the **/usr/spool** and **/private/adm** directories. Logfiles in these directories can grow and grow, particularly when there's a problem. While the logfiles in **/private/adm** are pruned automatically by the **cron** process, NeXT forgot about the files in **/usr/spool** – particularly those pertaining to **uucp**. Be sure to check the **/usr/spool/uucp** directory regularly, and be prepared to send old logfiles and syslogs to the Recycler if they get out of hand.

The challenge of maintaining free space on any computer system is ongoing. This is particularly true of sites with many users and systems that are used for lab work or multimedia applications. If you have any favorite disk-space-saving tips or tricks, please share them (send e-mail to the authors), and we'll mention them in a future issue. In the meantime, happy recycling.

DANIEL MILES KEHOE *and* SETH T. ROSS *are contributing editors for* NeXTWORLD. *They can be reached at dkehoe@nextworld.com and sross@nextworld.com.*

SYSADMIN

Hints and Tips

by DANIEL MILES KEHOE & SETH T. ROSS

Losing your root password

If you forget your system's root password, or for some other reason need to override it, two easy commands will allow you to set a new one. Power the system down and then back up. Immediately after the "Testing system" message is replaced by "Loading from disk," press the right Command key and the ~ (tilde) character on the numeric keyboard. This brings up the ROM monitor. Bring up the machine in single-user mode by typing **bsd -s** at the NeXT prompt (type **bod -s** if you're booting from an optical disk; **ben -s** for a network boot). When you get the "#" prompt, issue the following command:

```
# sh /etc/rc
```

This will initialize NetInfo. You can then easily change the root password by issuing the command:

```
# passwd root
```

Enter and then confirm a new root password. Power down and resume operation with the new root password.

None of this will work if a hardware password has been set on your system. Passwords limit access to the ROM commands. Losing a hardware password is not a pretty thing. For information on how to recover it, consult NeXT Technical Support or Systems Support course materials.

A welcome mat

If your users log in to your NeXT server via modem or terminal, you can greet them with a welcome. Here's how to set up a banner message. Open **etc/gettytab.** The first entry reads:

```
default:\
:ap:im=\r\n\r\nNeXT Mach (%h) (%t)\r\n\r\r\n\r:\
:er=\177:kl=^U:in=^C:lm=\r\n%h login\72 :sp#9600:
```

The "im" field sets the message that greets those who log on. By default, the banner returns "NeXT Mach," your hostname (signified by "%h"), and the tty name. You can replace or enhance this message. If you edit the entry so the "im" field reads:

```
im=\r\n\r\nYOU HAVE REACHED MYSERVER ... \r\n\r\nHome of Truly Good
Information \r\n\r\nNeXT Mach (%h) (%t)\r\n\r\r\n\r:\
```

your users will be greeted with the following message when they log in:

```
YOU HAVE REACHED MYSERVER ...

Home of Truly Good Information

NeXT Mach (myserver) (ttyp1)

login:
```

Isn't it nice to know you've laid down a welcome mat?

Making an announcement

Occasionally you'll need to make an announcement to everyone on the network (perhaps a central file server is about to go off line, or it's time for the Friday afternoon pizza party). You could send a mail message to every user, but not everyone may notice there's new mail. You could use the UNIX command **rwall** (documented in man pages and NeXTanswers sysadmin.553), but **rwall** only sends a message to open Terminal windows.

The best medium for an important announcement is voice. Try this technique if you'd like every user to hear a message: Record a voice message using the SoundPlayer application found in /NextDeveloper/ Demos and the Megapixel Display's built-in microphone. Use the Save option to save the sound in a file called **soundfile.snd.**

To play the message on every networked computer, enter the following command in a Terminal window:

```
albion> foreach i ((niutil -list / /machines | awk '{print $2}')
? rsh $i sndplay soundfile.snd
? end
```

The voice message will be heard on every networked computer. Note that users who do not set the Preferences option Public Sound Server will not receive voice notifications.

Please send any tips you'd like to share to the authors at the addresses listed on the previous page.

SYSADMIN

NeXT Question

BY SIMSON L. GARFINKEL

Q: Is there any way to attach a second physical terminal to a Cube – especially remotely – even if I'm just running a shell and not a workspace?

Miake-Lye
Lexington, MA

A: Yes. You can connect an ASCII terminal or a modem to your NeXT computer, but you won't be able to use Workspace Manager or any other NeXTstep applications.

1. First you will need a NeXT-to-terminal cable. (Note that you need a different cable for '040-based computers than for '030-based computers, since the serial ports differ on the two system boards). Type **man 4 zs** for a full description of the serial ports and cable you need.

2. Logged in as root, edit the file **/etc/ttys.** If you are using a hard-wired terminal, change the line starting with "ttya" (assuming you are using serial port A) to look like this:

```
ttya        "/etc/getty std.9600" vt100      on
```

If you are connecting a 2400-baud modem, change the line starting with "ttya" to look like this:

```
ttyda       "/usr/etc/getty A2400"       dialup      on
```

3. Send a HUP command to the **init** process. Do this by typing:

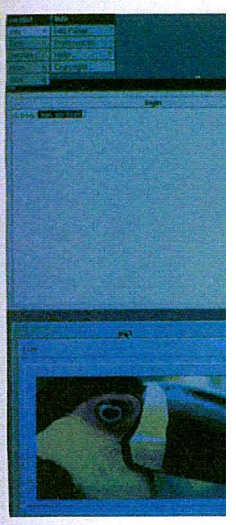
```
# kill -HUP 1
```

If you see strange characters on the screen or you don't see a prompt, then the baud rates, parity, or terminal types that are in **/etc/ttys** may not match the specs of your terminal.

SIMSON L. GARFINKEL *is a senior editor at* NeXTWORLD.

Product Show

X Windo



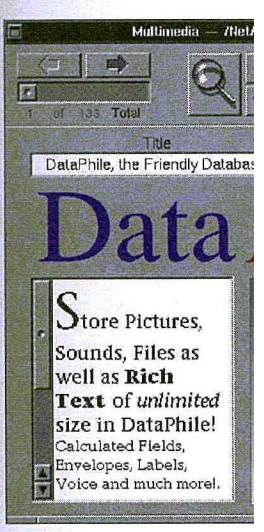
co-Xist™ gives you acces
X Window display envir

Features include: • Sing
(including NeXT Dimens
text between X and NeX
• Peaceful co-existence wi
• Rootless windows (ava

Pencom Software/9050 Capital
(512) 343-1111/Fax (512) 343

Circle

Stone De



The premier flatfile da
sophisticated enough fo
types include text, numer
links. Add, delete, or m
in full color using pow
powerful find and sort ca
include labels, envelopes

Stone Design/2425 Teodoro, N.
Fax(505) 345-3424

Circ

SIMSON00000940

SIMSON00000941

nt is voice. Try this
ge: Record a voice mes-
/NextDeveloper/ Demos
e. Use the Save option to

nputer, enter the follow-

print $2}()

tworked computer. Note
Public Sound Server

uthors at the addresses

to attach a second
a Cube – especially
m just running a shell
e?

a modem to your
Workspace Manager

cable. (Note that you
rs than for '030-based
two system boards).
al ports and cable you

. If you are using a
vith "ttya" (assuming

on
n, change the line

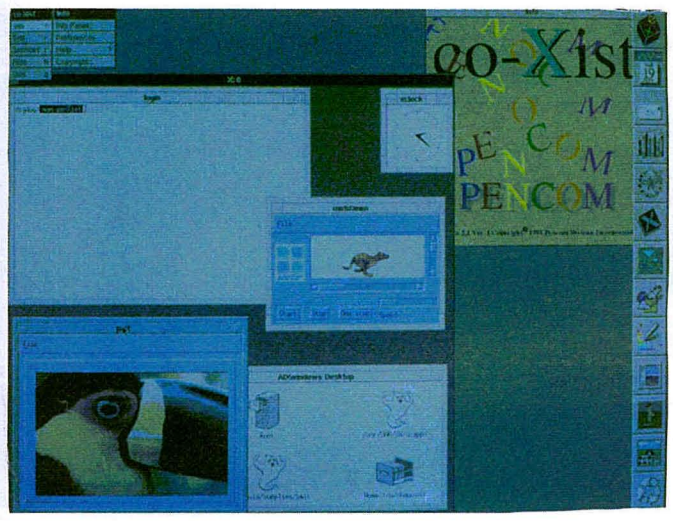
dialup on
ess. Do this by typing:

or you don't see a
al types that are in
minal.

editor at

Product Showcase

X Windows on NeXT?



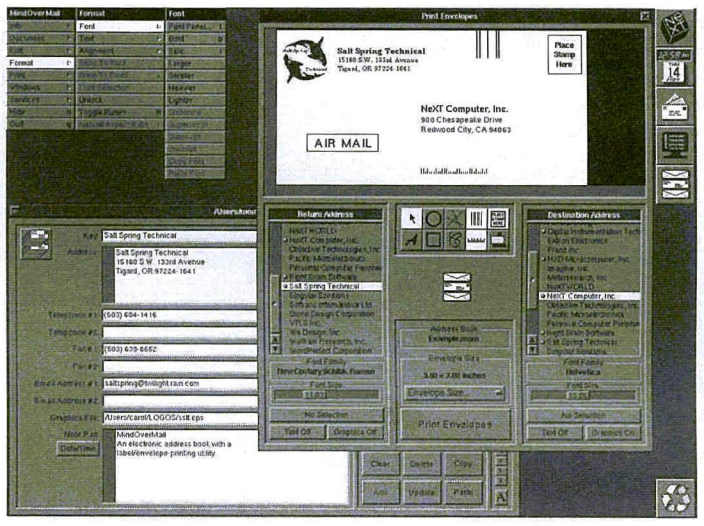
co-Xist™ gives you access to X Window based applications — a complete X Window display environment for the NeXT™ Computer.

Features include: • Single server support for color & gray scale X clients (including NeXT Dimension) • X 11 R4 compliance • Cut and paste text between X and NeXTstep • Support for popular window managers • Peaceful co-existence within NeXTstep • Motif 1.1 optionally available • Rootless windows (available 1/92) • Price $249

Pencom Software/9050 Capital of Texas Hwy N./Austin, TX 78759/(800) PENCOM 4
(512) 343-1111/Fax (512) 343-9650

Circle 101 on reader service card

MindOverMail

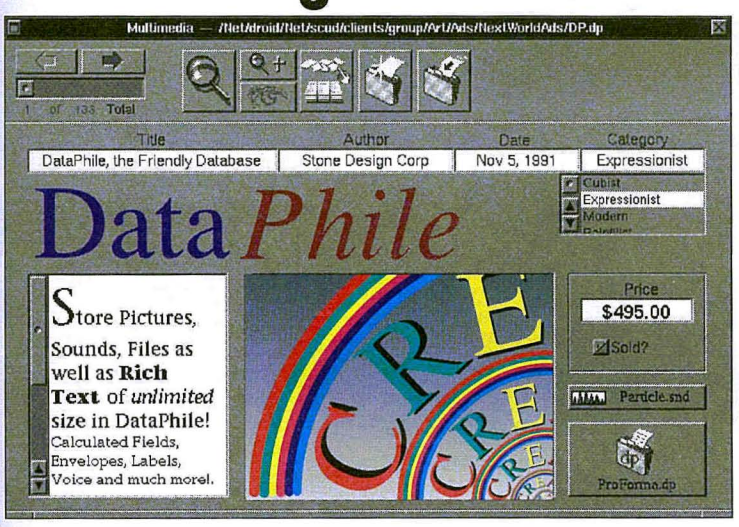


Addresses, phone numbers, fax numbers, email addresses, labels, envelopes! All done the way NeXT™ intended. No templates to edit. No files to merge. Just point, click, and drag. Sort by zip code. Print POSTNET and FIM bars. Built-in note pad for tracking phone calls. Custom graphics are a snap. Keep a library of personal and company logos. Import data into other applications through Services. Simplify and personalize your addressing tasks. Use MindOverMail! Introductory offer—$110 postpaid.

Salt Spring Technical/15180 S.W.133rd Avenue/Tigard OR 97224-1641/(503) 684-1416
Fax (503) 639-6652/saltspring@twilight.rain.com

Circle 102 on reader service card

Stone Design Presents:



The premier flatfile database for the NeXT™. Simple to use, yet sophisticated enough for a variety of personal and business uses. Field types include text, numeric, date, money, boolean, picture, sound, and file links. Add, delete, or modify fields at any point. Design multiple views in full color using powerful graphics tools. Automated data entry, powerful find and sort capabilities, voice annotation. WYSIWYG reports include labels, envelopes, forms and exports to merge and IMPROV files.

Stone Design/2425 Teodoro, N.W./ Albuquerque, NM 87107/(505) 345-4800
Fax(505) 345-3424

Circle 103 on reader service card

Stone Design Presents:

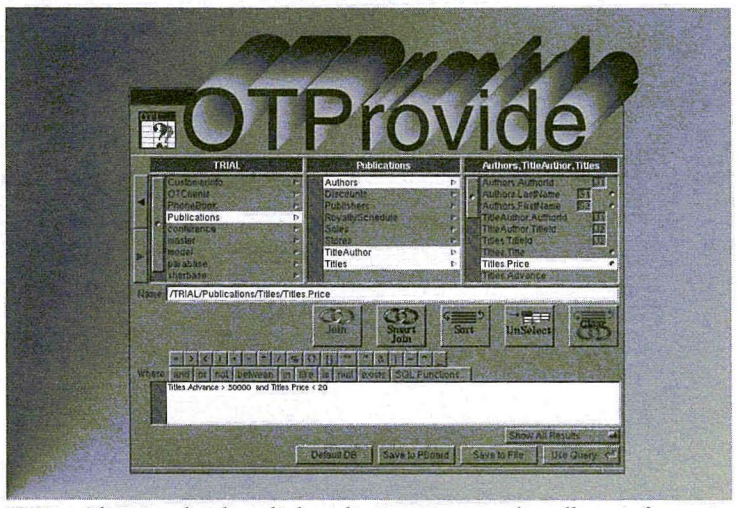


An extremely powerful, easy to use object oriented color drawing program. Allows simple creation of 2.5 dimensional graphic and text objects, with precise graduated fills, object skewing, shadows and multiples. Also, color WYSIWYG, TextArt effects and a user PostScript editing environment. Combine text, graphic shapes (ovals, rectangles, beziers, polygons, freehand objects, etc.), TIFF, and EPS images with precise layout controls, including scaling and rotation of TIFF and EPS files. Exports to TIFF and EPS.

Stone Design /2425 Teodoro, N.W./ Albuquerque, NM 87107/(505) 345-4800
Fax(505) 345-3424

Circle 104 on reader service card

Link Data to Improv™



OTProvide™ is a database link and query manager that allows information maintained in relational databases to be seamlessly and automatically integrated into Lotus Improv™ models. All levels of users can access information in databases.

Now with **OTProvide**, your model can be as current as the data in your database.

Call Objective Technologies today to get your copy of OTProvide.

Objective Technologies Inc./7 Dey St. Suite 1502/ New York, NY 10007/(212) 227-6767
Fax (212) 227-3567

Circle 105 on reader service card

Reduce Development Time!



Use [OT Palettes:2.0] to extend the NeXT Interface Builder™ environment.

GraphPalette™: Provides tools for graphing data in custom applications.

MathPalette™: Furnishes tools to develop applications that use *Mathematica*®. Featured in *NeXT on Campus* as a simple solution for connecting to *Mathematica.*

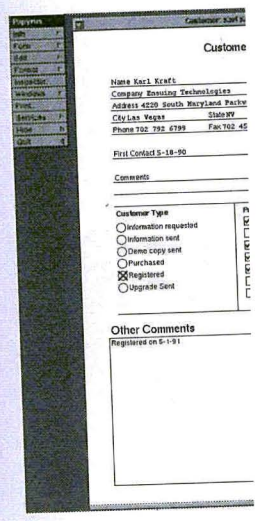
SmartFieldPalette™: Supplies data input fields that restrict and format input, report errors and field content changes.

ChooserPalette™: Provides selection list management functions.

Objective Technologies Inc./7 Dey St. Suite 1502/ New York, NY 10007/(212) 227-6767
Fax (212) 227-3567

Circle 106 on reader service card

PapyrusForms™



PapyrusForms is more tha
create, organize, and file tl
Copy-Paste, links to exter
objects, ease form creatio
your data. Includes over
Prices start at $250.

Ensuing Technologies/4220 S. Mc
788-2466/(702) 792-6799/Fax

Circl

Portable Mass Storage



Liberty Systems offers the smallest mass storage subsystems available on the market. From hard drives to nearly 1.5 gigabytes, to SyQuest cartridge drives, to DAT tape backup drives, to the newest 3.5" r/w magneto optical drives, Liberty provides fast and reliable storage for your NeXT™ computer. Whether you need portable backup capability or fast mass storage for multimedia presentations, Liberty caters to all your portable storage needs.

Liberty Systems/160 Saratoga Ave., Suite 38/Santa Clara, CA 95051/(408) 983-1127
Fax (408) 243-2885

Circle 107 on reader service card

Watch it in Full Color



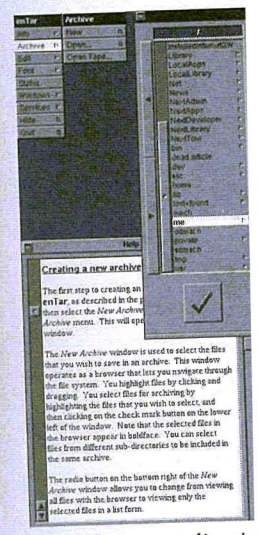
Introducing Color Digital Eye™ — a video frame grabber for your NeXTstation™ Color. "Grab" color video frames, retouch and save them. Also, produce stunning color animation sequences. The hardware comes with two, easy to use software applications, ColorSnapshot™ and ColorMovieWorks™.

Metaresearch also offers Digital Ears™, a precision audio digitizer that's powerful enough to be used for laboratory data acquisition. And SoundWorks™ a software package that gives you complete control over the sound in your NeXT™ computer.

Metaresearch, Inc./516 SE Morrison, Suite M1/Portland, Or 97214/(503) 238-5728

Circle 108 on reader service card

Backup your dat



enTar™ is an applicatic
mass storage devices. en
drives, and also floppy,
format, compression, au

Evaluate before buying:
by US mail with note req
send Email requesting "
OEM and site license in

Impact Software Publishing Inc.
Fax (607) 277-6303/ Email: in

Ci

SIMSON00000943

Product Showcase

nt Time!



Builder™ environment.
; data in custom

applications that use
n *NeXT on Campus* as
ecting to *Mathematica*.
iat restrict and format
ld content changes.
agement functions.

10007/(212) 227-6767

ard

olor



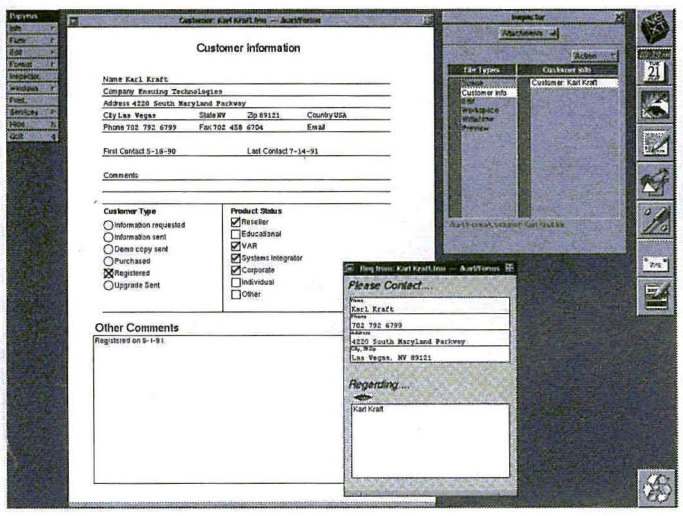
ame grabber for your
imes, retouch and save
quences. The hardware
s, ColorSnapshot™ and

on audio digitizer that's
lata acquisition. And
u complete control over

14/(503) 238-5728

rd

PapyrusForms™ for the NeXT™ computer

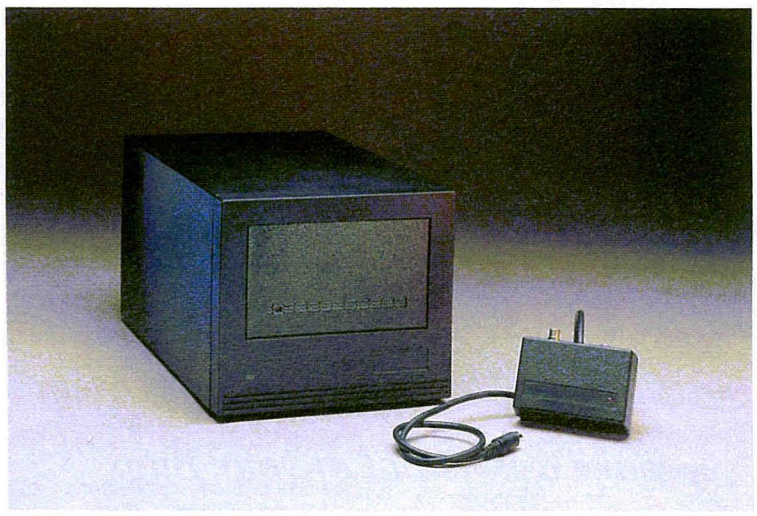


PapyrusForms is more than just an application to print forms, it helps you create, organize, and file them, easier than you could on paper. Automated Copy-Paste, links to external files, and run-time loading of user designed objects, ease form creation. You can also link form to form, to organize your data. Includes over 50 form templates that are useful in any office. Prices start at $250.

Ensuing Technologies/4220 S. Maryland Parkway #406/Las Vegas, NV 89119-7525/1-800-788-2466/(702) 792-6799/Fax(702)792-6794/Papyrus@bodi.portal.com

Circle 109 on reader service card

The one peripheral everyone will want!



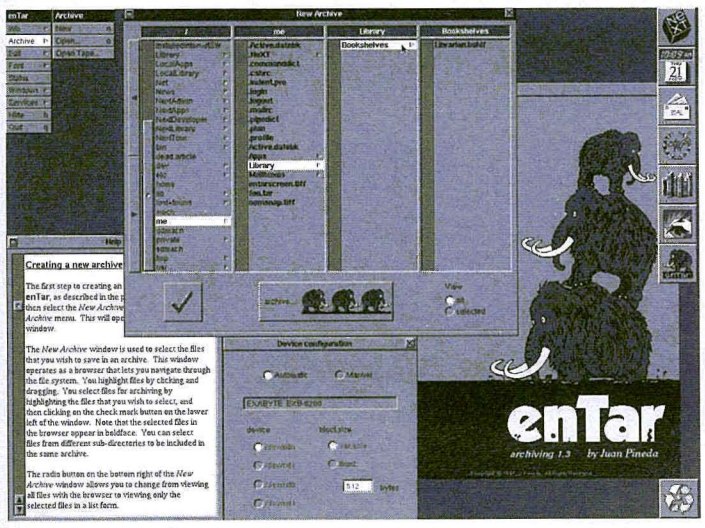
The Minimal Hardware, our long-awaited phone interface, starts shipping in Q2 1992. Also: A fully integrated, general-purpose phone/VoiceMail/NeXTmail/Fax application that runs on top of any phone interface hardware. Sold separately, or bundled for around $250.
Hard drives: Custom-formatted, pre-tested, plug and play Seagate Wren drives. Includes all cables, new optional auto-power-on feature, unlimited 800# support.
660Meg $1695/$1895
1Gig $2295/$2495 (internal/external)

1-800-CUBE-RTE

The Cube Route, Inc. /430 Broadway/Cambridge, MA 02138-4226/(800) 282-3783 (617) 876-8554

Circle 110 on reader service card

Backup your data to DAT, 8mm, Floppy or OD



enTar™ is an application that will painlessly backup your user data to mass storage devices. enTar™ works with DAT, 8mm and other SCSI tape drives, and also floppy, optical and other removable disks. Features: tar format, compression, autoconfiguration. Price: $49.

Evaluate before buying: demonstration app available. For floppy, send $5 by US mail with note requesting "enTar floppy". To obtain app by EMail, send Email requesting "enTar by Email".
OEM and site license inquiries welcome.

Impact Software Publishing Inc./210 Lake Street/Ithaca, NY 14850/(607) 277-8623 Fax (607) 277-6303/ Email: impact@impact.shaman.com

Circle 111 on reader service card

Shadow High Performance Storage



Not just another "Mac" drive painted black. Shadow Series drives are designed and prepared for optimum NeXT™ performance. Special formats, cache options, cabling and styling.

Hard Disks by Imprimis Wren & Swift, Fujitsu, Maxtor and Micropolis. SCSI Tape systems using Archive & TEAC. Removable media by SyQuest Technology. Opticals and DAT by various manufacturers.

All drives are preformatted, tested and configured and come with full 5 year warranties. Delivery worldwide via insured air courier.

Park Systems Technology Ltd./10971 - 101 St./Edmonton, AB, Canada T5H 2S9 (403) 424-0530/Fax (403) 421-4039

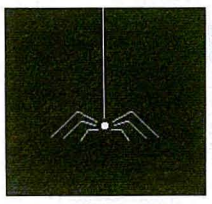
Circle 112 on reader service card

Product Showcase

New 2.0!

BugByte

New 2.0!



Take a Byte out of your Bugs

BugByte™ is a revolutionary graphical debugger providing the NeXT™ software developer with an accelerated environment for application debugging. Its intuitive user interface increases productivity and effectiveness immediately. **BugByte™** features dynamic display of source-level execution, drag and drop setting of breakpoints, remote debugging, and display of variable contents as an integral part of the application. Tools for examining memory, signals, and stack frames, as well as dynamic variable tracing assist the developer during program execution. Now shipping, $295.

ONyX Systems Inc./P.O. Box 101596/Fort Worth, Texas 76185/(817) 432-9107
Fax (817) 244-2983

Circle 113 on reader service card

The Ultimate Peripherals by TECOR



Tecor has expanded! 3.5" and 5.25" internal and external drives, CD-ROM, DAT drives, and a new line Removable Hard Drives from the best manufacturers — all at the lowest prices available. Our removable hard drives are not the same flimsy cartridge units sold by others. Shop and compare. Our hard drive enclosures are still the very best money can buy. Call for the latest prices.

TECOR Inc./237 Miramar Drive/Santa Cruz, CA 95060/(408) 458-3197/Fax(408) 425-1804
tecor!info@ucscc.ucsc.edu

Circle 114 on reader service card

Picture your ad here!

Fill this space with your ad for only:

	1x	3x	6x
1-2 units per issue	$1,400	$1,300	$1,200
3-4 units per issue	$1,200	$1,100	$1,000

Make the most of your advertising dollar by letting *NeXTWORLD* do the work for you. The Product Showcase will give you extensive reach to a dedicated NeXT audience. It's perfect for introducing and test marketing new products. To participate, please submit the following: one four-color trasparency or 35mm slide, or electronic/computer-generated art supplied on disk; 75 words of ad copy; and a brief headline. *NeXTWORLD* handles color separation and ad layout for you. Deadline: Six days prior to issue close date. For media kit, please contact *NeXTWORLD*.

Company Name/Street Address/City, State, ZIP Code/Telephone Number
Fax Number/Modem Address/ Etc.

SOLUTION TO NEXTCROSTIC ON PAGE 9.

G(UY) KAWASAKI, *SELLING THE DREAM*: "When you think you are going to change the world, working ninety hours a week doesn't seem like so much. Steve Jobs even printed sweatshirts for us that said, 'Ninety hours a week and loving it.'"

Selling the Dream, by former Apple evangelist Guy Kawasaki, is published by Harper Collins.

A. GHETTO
B. KNOW-HOW
C. ADVOCATES
D. WON'T
E. ACIUS
F. SWIM
G. ATHENS
H. KEWPEE
I. INFERNO
J. STETSON
K. EVANGELIST
L. LATH
M. LOWER
N. IRONY
O. NABOKOV
P. GHERKIN
Q. TURNKEY
R. HEDGES
S. EYESIGHT
T. DISH
U. RETINUE
V. ERUDITION
W. ADJOURNS
X. MUSHY

Classified

NeXTWORLD magazine Classifieds is a qu
ture. Rates effective January/February Issue
line rates $40.00. Thirty -six characters eq
(count each letter, space and punctuation
character). Four-line minimum, seven lines p
column inch rates, please call or write for c
card information. Check or money order
check) must accompany copy and be recei
prior to close date. All ads accepted at the
the publisher. *NeXTWORLD* magazine 50
San Francisco, CA 94107 415/978-3182.

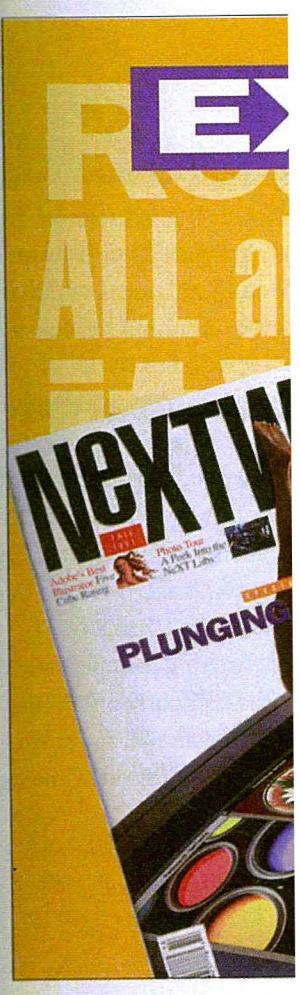
USER GROUPS

BAY ARE

NeXT GR

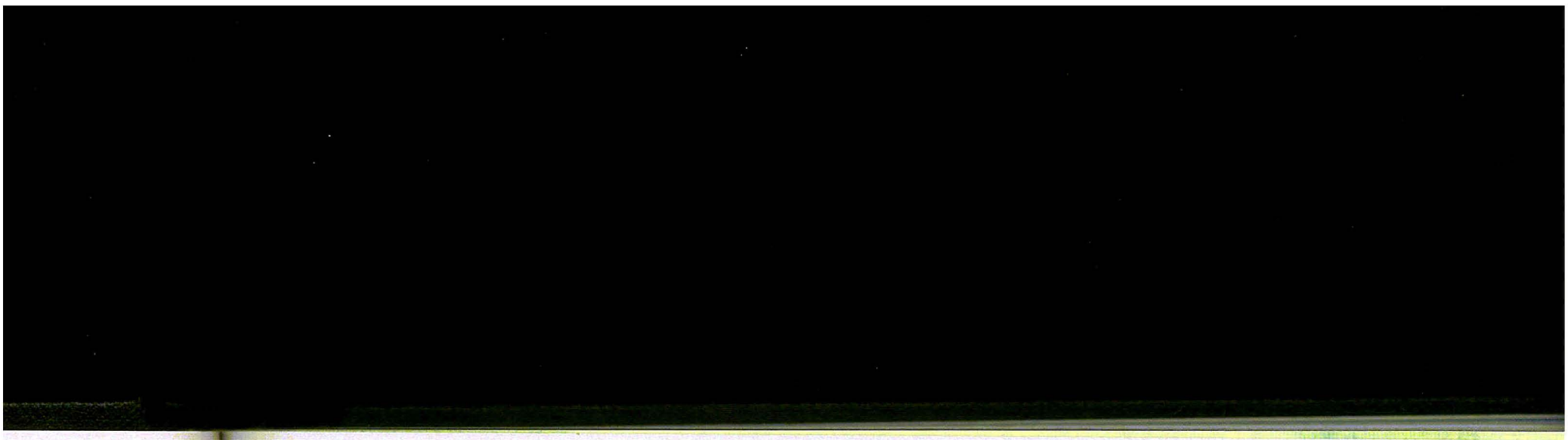
Join BANG, the world's larg
puter user group dedicated
NeXT platform! BANG acts
rum for communication in th
community, sponsoring r
meetings, newsletters, specia
groups, user support, and m

For more info, please contact:
BANG
P.O. Box 1731
Palo Alto, CA
+1.415.327.BA
info@BANG.o



SIMSON00000944

SIMSON00000945



s by TECOR



ıd external drives, CD-
ırd Drives from the best
e. Our removable hard
d by others. Shop and
ery best money can buy.

8-3197/Fax(408) 425-1804

GE 9.

EAM: "When
d, working ninety
eve Jobs even
hours a week

ist Guy Kawasaki,

ER
IY
OKOV
RKIN
NKEY
GES
IGHT

NUE
DITION
URNS
HY

Classified

NeXTWORLD magazine Classifieds is a quarterly feature. Rates effective January/February Issue, 1991. Per-line rates $40.00. Thirty -six characters equal one line (count each letter, space and punctuation mark as a character). Four-line minimum, seven lines per inch. For column inch rates, please call or write for complete rate card information. Check or money order (or certified check) must accompany copy and be received six days prior to close date. All ads accepted at the discretion of the publisher. *NeXTWORLD* magazine 501 Second St., San Francisco, CA 94107 415/978-3182.

USER GROUPS

BAY AREA NeXT GROUP

Join BANG, the world's largest computer user group dedicated to the NeXT platform! BANG acts as a forum for communication in the NeXT community, sponsoring monthly meetings, newsletters, special interest groups, user support, and more.

For more info, please contact: BANG, P.O. Box 1731, Palo Alto, CA 94302, +1.415.327.BANG, info@BANG.org

CONSULTING SERVICES

Joe Barello Consulting

NeXT Computer Software Design Training System Administration

4043A 23rd Street
San Francisco, CA 94114
415.647.6398
joeba@jbc.com

Proven consulting and development services on the NeXT™ platform from Adamation. Adamation's NeXT credits include: ported INGRES, a relational data base program, to the NeXT platform; Developed two commercial applications, Who's Calling?, a client management system, and Live Wire, a product for sharing multimedia information; Created over 30 font and back-end application development tools and objects;
Adamation offers you a single resource through which to maximize the potential of the extraordinary NeXT technology. Call us and put our depth of NeXT experience to work for you. Adamation 1435 Center St., Oakland, CA 94607 415/452-5252

MARKETING

Marketing Help for NeXT Developers

We shrinkwrap your dreams. Our experience can turn your projects into saleable products. From marketing plans to marcomm collateral, we know what works in the very special NeXT market. Don't leave success to chance. Call for information now.

FORTUITY
415-488-9142
PO Box N, Forest Knolls, CA 94933

SHAREWARE

Internet Blues? Get the latest shareware and PD software on floppies at reasonable prices from softSHARE. Call and get our catalog today. 408/275-8271 or 408/275-8274 fax.

HARDWARE

KAO 4MB Disks $56 Supra Fax/Modem 14.4 V.32bis, V42, 9600 Fax Send/Rcv $399. PARK SYSTEMS 10971 – 101 St., Edmonton, Alberta, Canada T5H 2S9 Tel (403) 424-0530 Fax: (403) 421-4039 Canada (800)-MOR-BYTE.

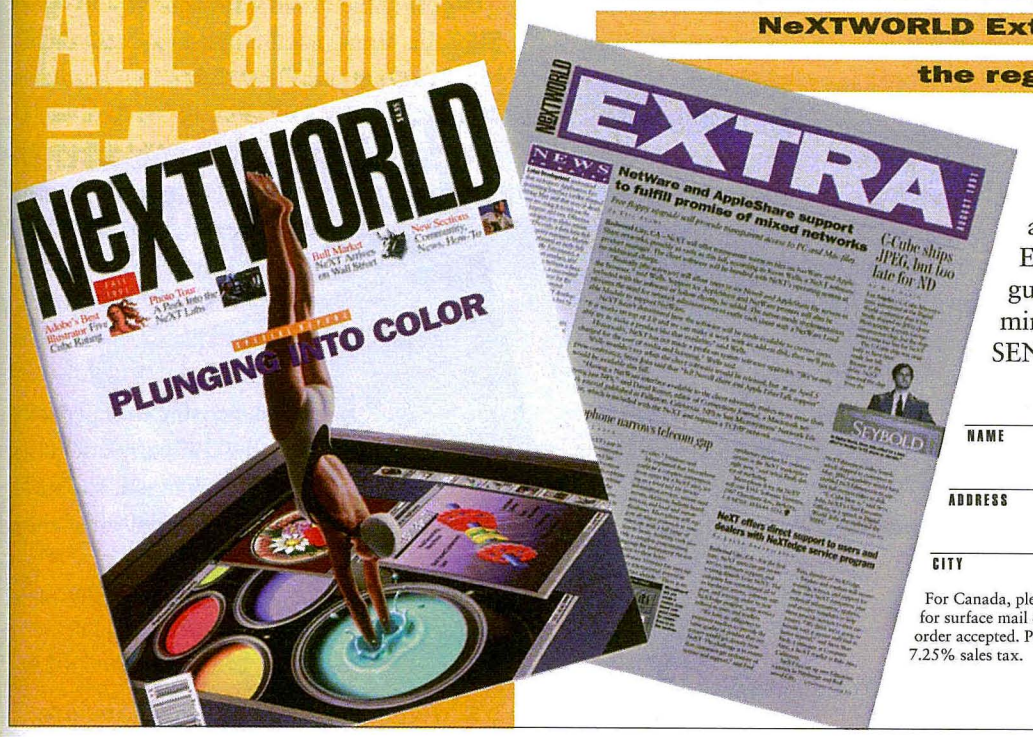
DISKS

Small ad = Big Savings. Not only do we have the best pricing anywhere but we're also better looking. Toshiba 3 1/2 ED Disks (10 pak) $71.00. sony 3 1/2 DS/HD (10 pak) $15.00. Yes, we have bulk pricing. Boss Disks (213) 462-3500 ex 02 - Conrad

EXTRA! EXTRA!!!

Read ALL about it

Read all about it in NeXTWORLD and NeXTWORLD Extra. Only $23.95 – 40% off the regular subscription rate!



Yes! Please start my subscription to NeXTWORLD for just $23.95. I'll get 4 quarterly issues, plus an additional 8 BONUS issues of NeXTWORLD EXTRA – the NeXTWORLD newsletter that's guaranteed to keep me informed with up-to-the-minute facts about the hottest computer market. SEND NO MONEY NOW. We'll bill you later.

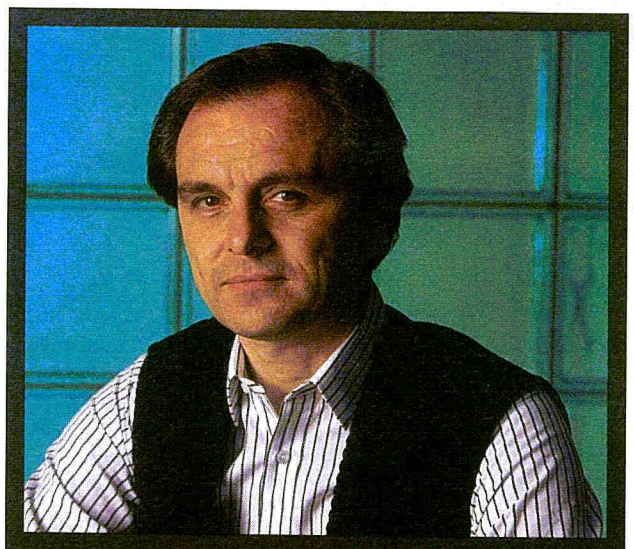
NAME

ADDRESS

CITY STATE ZIP

For Canada, please add $18 in U.S. funds only. Add $80 for airmail delivery. Add $15 for surface mail delivery. Orders must be prepaid in U.S. funds only. Check or money order accepted. Please fax 1-415-442-1891 to charge to your Visa/MC. CA residents add 7.25% sales tax.

5HSE5



Rearview Mirror

JEAN-LOUIS GASSÉE

Let's begin with a look in the rearview mirror: The company's technology is widely admired, though perhaps just as widely disparaged. The product has already been through several iterations, while the marketing strategy has vacillated from one approach to another without hitting on a formula compelling to the mainstream computer market.

NeXT's predicament in 1992 is not very different from Apple's in 1986. The question is: Can NeXT duplicate in some measure the belated success of the Macintosh? Is it now, as it rolls out its third round of products and its fifth or sixth marketing approach, poised to finally break through?

In my view, it is more than possible that the combination of strategies now taking shape at NeXT can yield the long-awaited breakthrough into the major leagues. The first has to do with the natural fit (as opposed to a rhetorical one) between a facet of the NeXT product – its programming tools – and the needs of a market segment – corporate custom-development work. The other dimension is NeXT's apparent decision to broaden the hardware base by selling NeXTstep as a software product.

It may also help the company develop a better, more competitive corporate culture.

At the risk of belaboring an obvious comparison, let's look again at Apple in its years of uncertainty. Recall that its $20 billion or so of cumulative Macintosh sales were preceded by two failures: the Apple III and the Lisa. Both fiascos were useful, and not just in reminding their creators they were mere mortals.

Of course, there was also the Apple II, which demonstrated that it is possible, on your first try, to launch one of the most successful companies in American history. With the Macintosh, Apple learned that customers didn't take kindly to paying for work-in-progress. Developers taught the company that they preferred computers with real programming tools and documentation. It took two years to overcome initial problems such as too little RAM and no hard disk. Add another year, a breakthrough application in desktop publishing, and two more CPUs – and then, only then, did the billions start pouring in.

Seen in the light of the Macintosh travails, NeXT's own time line doesn't look so unusual.

Early attempts to position the NeXT as the higher-education workstation didn't succeed. The focus on high-end DTP and graphics, interpersonal computing and the NeXTdimension's multimedia capabilities didn't work either. But none of this was wasted. At each step, the company acquired more of a loyal following.

The new game plan relies on one key assumption: large corporations have experienced enough programming pains to put a high price on the custom- applications-development capabilities of the NeXT system. And NeXT does, indeed, deliver OOP now, as their ads point out. The real long-term advantage resides in burrowing NeXT machines deep into mission-critical corporate applications, in making NeXT an indispensable part of their computing life.

Custom development can become NeXT's desktop publishing, an end run around the established players with a fundamentally new application. Instead of a frontal, expensive and perhaps unwinnable battle for the desktops dominated by Apple and Microsoft, NeXT seeks to get in through the custom-applications back door while it broadens the hardware base for its software. Then, from that custom development base, with the help of more shrinkwrapped software from developers it will continue to win, NeXT can conquer more "straight" desktops from its position of a respected, well-liked insider.

Now, for the second dimension. If press reports are accurate, NeXT is preparing to port its software crown jewels to high-end, high-volume PC clones.

The Intel port moves NeXT away from the dangerous P-word – proprietary – to the safer S-word – standard. This helps developers commit to working on the NeXT platform, or at least on the software part of the NeXT platform.

The balancing act here consists in giving more currency to NeXT's system software without destroying hardware sales. NeXT must successfully exchange the protection of its proprietary hardware/software interlock for a chance to run its software on a larger number of computers, at the risk of losing margins on its own hardware.

Of course, the port must work well. But what does "well" mean, exactly? NeXT could narrow the ported function set in order to reach a broader population of Intle boxes. But if the port is bland, you lose. If the port looks good, you risk raising questions about the need for this fancy hardware of yours. On balance, the better port looks likes the more reasonable risk.

In that case, you need unusual hardware (DSP and graphics, for instance) on top of the standard clone platform. If it is too expensive or too hard to procure, you risk losing the broad hardware base you were looking for. NeXT's way out of this strait may involve alliances with hardware vendors interested in selling and supporting the premium hardware configurations the port calls for.

This leads to another advantage of NeXT's new strategy: going around the channel obstacle. Selling directly to corporations for mission-critical applications and setting up links with powerful clone suppliers deals neatly with the lack of retail presence that has been a problem for NeXT.

Anything far-fetched or missing? Not really. The strategy is natural, an outgrowth of successful customer experiences. Potential customers are in pain and can afford the remedy.

Many would be pleased to see NeXT succeed, proving that persistence, creativity, and patient investors can indeed make the company into a major player. This time it would be an unquestioned accomplishment for Steve, forever erasing any suggestion of luck, about merely having been at the right place at the right time.

The journey would have one reward, deliver one crucial proof: NeXT isn't Apple, but Steve is Steve.

JEAN-LOUIS GASSÉE, *former president of Apple Products, is now the chairman and CEO of Be Inc. in San Jose, California.*

PHOTOGRAPH BY ED K

THE C
25G
Do you wish you could
with enough capacity, s
tion to backup unatten
Could you recreate
scratch in the time it ta
FAST BACKUP, FAST R
Introducing the CY-85
drive that gives you up
25 GB on a single tape.
And with transfer rates
of up to 90 MB per mi
ute, backup takes less
time, frees resources, an
makes frequent backu
simple and convenient.
And that's not all.
The CY-8500 offers fast
file search capability. Sc
you get the advantages
of high capacity and
Rock Landing

SIMSON00000946

SIMSON00000947

desktop publishing, an end
amentally new application.
winnable battle for the desk-
T seeks to get in through
adens the hardware base for
ent base, with the help of
it will continue to win, NeXT
s position of a respected,

orts are accurate, NeXT is pr
-end, high-volume PC clone
dangerous P-word – pro-
helps developers commit to
the software part of the

ng act here consists in giving
NeXT's system software
g hardware sales. NeXT
exchange the protection of it
are/software interlock for
software on a larger numbe
ne risk of losing margins on

ne port must work well. But
nean, exactly? NeXT could
function set in order to reac
on of Intle boxes. But if the
lose. If the port looks good
estions about the need for
e of yours. On balance, the
es the more reasonable risk.
you need unusual hardware
for instance) on top of the
tform. If it is too expensive
l hardware base you were
involve alliances with hard-
g the premium hardware

new strategy: going around
ions for mission-critical
lone suppliers deals neatly
roblem for NeXT.
The strategy is natural, an
otential customers are in

d, proving that persistence,
the company into a major
complishment for Steve,
ely having been at the right

one crucial proof: NeXT

t of Apple Products,
Jose, California.

PHOTOGRAPH BY ED KASH

THE ONLY TAPE DRIVE THAT PUTS 25GB ON A SINGLE 8MM TAPE.



Do you wish you could find a backup system with enough capacity, speed, and sophistication to backup unattended?

Could you recreate a document from scratch in the time it takes you to restore it?

FAST BACKUP, FAST RESTORE.
Introducing the CY-8500, the 8mm tape drive that gives you up to 25 GB on a single tape. And with transfer rates of up to 90 MB per minute, backup takes less time, frees resources, and makes frequent backup simple and convenient.

And that's not all. The CY-8500 offers fast file search capability. So you get the advantages of high capacity and fast transfer rates plus the ability to locate and restore your files quickly – about 75 times faster than normal speed.

TRUE "PLUG-AND-PLAY" COMPATIBILITY WITH:

Alliant	Gould	PC 386/ix
Alpha Micro	HP	PC MS-DOS
Altos	IBM AS/400	PC Xenix/ Unix
Apollo	IBM Mainframe	Pertec
Arix	IBM RISC/6000	Plexus
AT&T	IBM RT	Prime
Basic-4	IBM S/38	Pyramid
Concurrent	ICL	Sequent
Convergent	Macintosh	Silicon Graphics
DataGeneral	McDonnell Douglas	Stratus
DEC 3100	NCR	Sun
DEC BI-Bus	Novell	Unisys
DEC HSC	OS/2	Wang
DEC Q-Bus	PS/2	*and more*
DEC TU/TA81		
DEC Unibus		

CONFIGURATION FLEXIBILITY.
The state-of-the-art liquid crystal display gives you complete drive status information. Command under execution, transfer rate, tape remaining, and ECC are presented in a clear easy-to-read format. By offering such features as data compression – for five times the storage capacity per tape – and data encryption – giving you data access control – the CY-8500 adapts to your company's growing needs. We'll adapt to your site requirements too, with rack mounting options and cable lengths of up to 80 feet.

PROVEN TECHNOLOGY.
Best of all, the CY-8500 offers peace of mind. 8mm helical scan technology, designed for data recording, gives you demonstrated performance and reliability. Not an adaptation of an audio recording format.

The CY-8500 is part of a complete family of tape backup products that range in capacity from the 150 MB ¼" cartridge streamer to the 2 TB cartridge handling system. All backed up by our in-house technical support group and 12-month warranty. For more information on how you can enjoy the best value in tape backup, call today at 804/873-9000.

CONTEMPORARY CYBERNETICS Group

Rock Landing Corporate Center · 11846 Rock Landing, Newport News, VA 23606 · 804/873-9000 · FAX 804/873-8836

Circle 26 on reader service card

Good Drives Wear Black



If you need drives for your NeXT computer, PLI is the place to go. Whatever you need, we have it in black. 2.88MB floppy drives, hard disk drives, removable drives, optical drives, CD-ROM drives and DAT backup drives with easy to use software.

Backup in Black
If you need a serious backup solution, PLI can help. The PL DAT for NeXT gives you 2GB of storage per tape. And because we include enTar, from Juan Pineda, backing up won't put you in a black mood. Archiving is as easy as selecting files in a browser.

Black SneakerNet
If you need to get data from one NeXT to another, and you can't use a network, then SneakerNet is the answer. Lace up your high-tops and grab one of our high-capacity floppy diskette or removable hard disk drives. We have 2.88MB floppies and 21MB Floptical, plus 45MB and 90MB SyQuest-based drives.

NeXT, enTar, Floptical and SyQuest are trademarks or registered trademarks of their respective companies.

Black to the Future
CD-ROM will soon be a major medium of software distribution on the NeXT, just as it is on other platforms. Out-fox your competitors and get a PL CD-ROM drive today!

Black Light
Lasers are the way of the future in data storage, and PLI has three great optical drives for your NeXT machine. They offer high-capacity removable storage and outstanding reliability, with a variety of speeds, form factors, capacities and price points from which to choose.

In the Black
PLI is more than just a drive company with a lot of black boxes. We offer complete support; full manufacturer warranties, extensive burn-in and testing prior to shipment, good technical support, quick repairs when you need them and the security of dealing with a company that's been in the business for seven years. And best of all, we offer all this at affordable prices.

The most trusted name in storage solutions

PLI

Peripheral Land Incorporated
47421 Bayside Parkway, Fremont CA 94538
510. 657. 2211 / 800. 288. 8754 • FAX 510. 683. 9713

Circle 7 on reader service card

NE

SUMME
1992

Game Theory
Primer to NeXT
Programming

HIGHER E

DA

SIMSON00000948